

NEW AND LITTLE KNOWN PLATYCNEMIDIDAE AND COENAGRIONIDAE FROM NEW GUINEA AND THE SOLOMON ISLANDS (ODONATA)

by

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With notes added by J. van Tol

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ABSTRACT

Five new species of Platycnemididae (Odonata), viz., *Rhyacocnemis prothoracica*, *Salomocnemis* gen. nov. *gerdae*, *Lieftinckia malaitae*, *L. isabellae* and *L. ramosa*, and four new species of the genus *Teinobasis* (Coenagrionidae), viz., *T. simulans*, *T. obtusilingua*, *T. chionopleura* and *T. imitans*, are described. *Papuagrion gurneyi* Lieftinck and *Teinobasis emarginata* Lieftinck are synonymized with *Teinobasis aluensis* Campion. Besides several other species of these families from the Solomon islands are discussed.

This posthumous publication concludes the scientific odonatological studies of Dr M. A. Lieftinck.

[INTRODUCTION]

by J. van Tol

After the death of Maurits Anne Lieftinck on April 12th, 1985, most of his scientific material was donated to the Rijksmuseum van Natuurlijke Historie (Leiden). I have thought it one of my first tasks to investigate whether the manuscripts that Dr Lieftinck had at hand, could be prepared for publication. During my last visit to him in February, 1985, he showed me drawings and manuscripts in preparation. One large manuscript on the genus *Procordulia* and allied genera, for which many drawings were already prepared, is not available for publication; the second manuscript has resulted in the present paper.

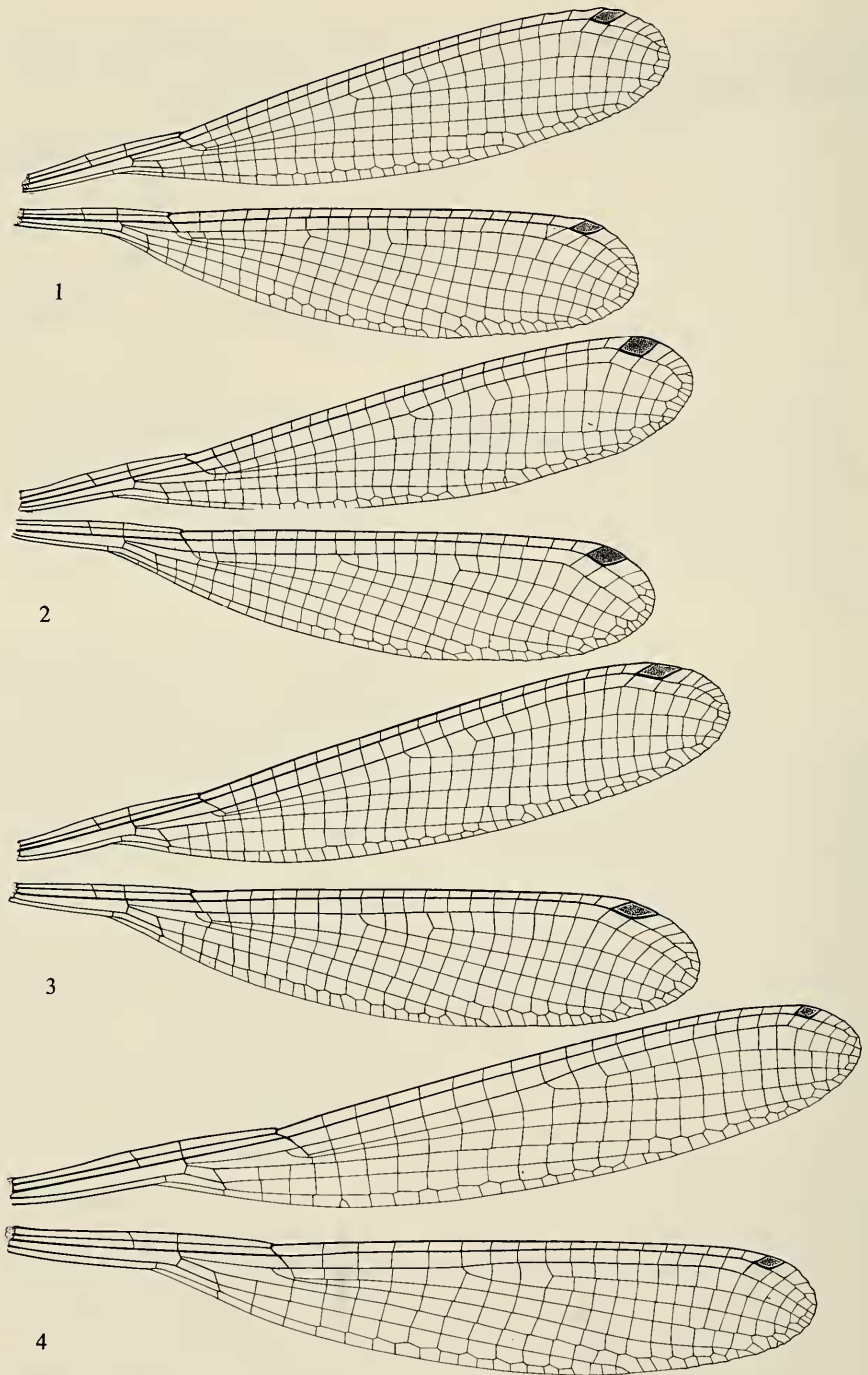
The manuscript appeared to be almost complete, and thus suitable for publication. The drawings and photographs were all mounted on cardboard, and numbered. The descriptions of all but one species were available, but a general introduction, an introduction to the Platycnemididae and concluding remarks were lacking or not in a form ready for publication. I have added the minimum amount of text, restricting myself to additions that were needed to publish a consistent paper, viz., a title, an abstract, an introduction, a list of species included, a few titles of chapters (i.e. names of genera), the refer-

ences in the next to the figures, the captions of the figures, and the references. No serious problems were met with this work. The number of scientific papers in this field is rather limited, so that I could easily find the works referred to. The captions to the figures were prepared from notes made in pencil with the drawings, as well as from the text. Since the description of the specimens from the Thomas W. Donnelly collection, numbered "72 × 040", was lacking, I have left out the preliminary new genus and species name for this taxon, which is closely related to *Torrenticnemis*. The figures, which were already mounted by Dr Lieftinck, are, however, included. The names of chapters added by me are indicated in square brackets.

I should like to emphasize explicitly here, that Dr Lieftinck should be considered the author of all new names introduced in this paper.

[ACKNOWLEDGEMENTS]

The cooperation of the curators of the Odonata departments of the following institutions is gratefully acknowledged (the abbreviations used for the collections are given in brackets): Bernice P. Bishop Museum, Honolulu (BISH), British Museum (Natural History), London (BM), Muséum National d'Histoire Naturelle, Paris (MP) and United States National Museum, Washington (USNM).



Figs. 1—4. Wings of Platynemididae. — 1, *Idiocnemis obliterated* Liefstinck, 1932; 2, *Paramecocnemis erythro-stigma* Liefstinck, 1932; 3, *Lochmaeocnemis malacodora* Liefstinck, 1949; 4, *Torrenticnemis filicornis* Liefstinck, 1949.

The Rijksmuseum van Natuurlijke Historie, Leiden, is abbreviated as ML.

Special thanks are due to Dr Thomas W. Donnelly (Binghamton, N.Y.) for making specimens from his own collection available for study.

[LIST OF SPECIES INCLUDED]

Platycnemididae

Genus *Rhyacocnemis* Lieftinck, 1956
R. prothoracica spec. nov.

Genus *Salomocnemis* gen. nov.
S. gerdae spec. nov.

Genus *Lieftinckia* Kimmins, 1957
L. salomonis Kimmins, 1957
L. lairdi Lieftinck, 1963
L. malaitae spec. nov.
L. kimminsi Lieftinck, 1963
L. isabellae spec. nov.
L. ramosa spec. nov.
Lieftinckia spec. indet. 1
Lieftinckia spec. indet. 2

Coenagrionidae

Genus *Teinobasis* Kirby, 1890
T. aluensis Campion, 1924
T. simulans spec. nov.
T. obtusilingua spec. nov.
T. chionopleura spec. nov.
T. imitans spec. nov.
T. bradleyi Kimmins, 1957

PLATYCNEMIDIDAE

Rhyacocnemis Lieftinck, 1956

Rhyacocnemis prothoracica spec. nov.
(figs. 5, 8)

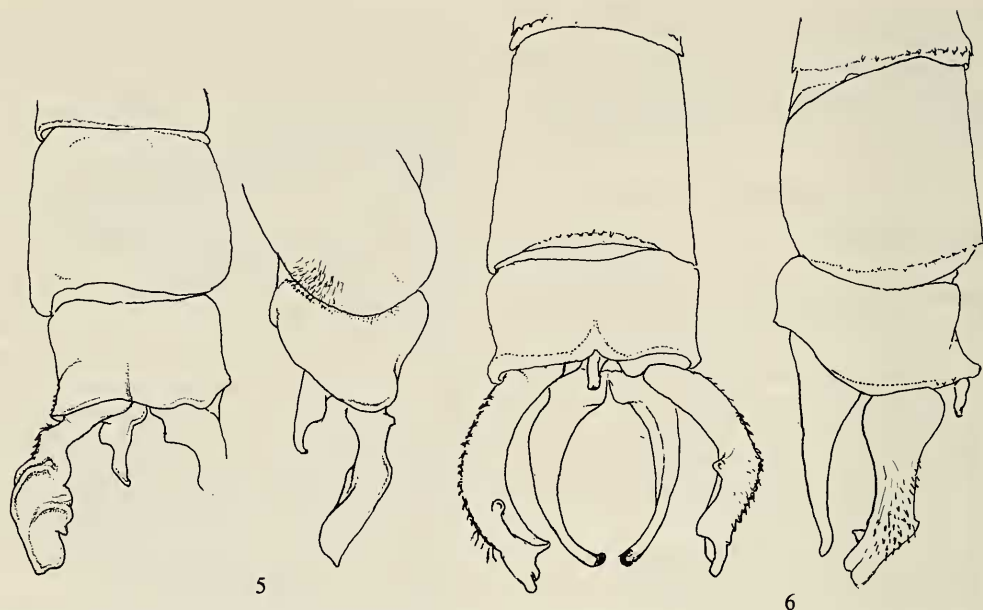
Material. — NE. New Guinea: 1 ♂ (adult, holotype), Morobe Dist., stream at Gurakor, Wau Rd., 500 m, 25.x.1972, nr. 72X044, Thomas W. Donnelly leg., in coll. ML.

Male (adult, holotype). — Smaller than *R. sufficiens* Lieftinck, 1956. Head short and broad, width across eyes only 4.0 mm. Labium bright creamy yellow, median lobe with short V-shaped emargination about 1/5 as deep as midlength of lobe itself, its apical lobes somewhat convex exteriorly, obtusely rounded off, tips, as also the outer border of palpi, fringed

with ferruginous bristles. Labrum and clypeus broad and prominent as in *sufficiens*, well visible from above; labrum convex and widest anteriorly, its surface smooth and rather shiny, deep black; anteclypeus pale at middle, postclypeus with pair of bright yellow transverse spots, one each side, which taper inward leaving a thick T-shaped black mark occupying most of the surface. Frons in front and whole genal area taken up by a sharply defined chrome yellow bar connecting the eyes, which extends upward to almost reaching the antennal sockets; remainder of head above and underneath deep coal black with no other pale marks or pruinose areas than a pair of large, isolated, pear-shaped sky-blue postocular spots pointing inward. Antennae long (about 2.5 mm), black; scape cylindrical, short and thick, only little longer than its diameter at apex, pedicel slender, slightly clubbed, about 7–8 times as long as its apical width, third segment much thinner but of equal length, the distalia long and thread-like.

Prothorax markedly dissimilar to that of *R. sufficiens*; anterior lobe long, rather depressed and lacking a distinctly swollen anterior rim, its dark surface indistinctly mottled with ferruginous specks and with a pale margin; pronotal tubercles strongly raised, forming a pair of robust slightly diverging cone-shaped and bluntly pointed processes whose surface is dull and coarsely wrinkled; these pyramidal bosses are about equal in height to the smooth propleurae and directed obliquely upward and backward; posteriorly, they are feebly ridged on either side, enclosing a more flattened forward slanting posterior face; immediately behind each of them arises a small and thin transverse plate, situated on a much lower level; posterior lobe broad and collar-shaped, about equal at midlength to the anterior lobe by lying flatly down, its side angles triangular, slightly projecting and a little downbent. Colour of whole dorsal surface of prothorax lustreless dark brown on coarsely wrinkled ground, all lateral parts remaining smooth and contrastingly coloured a bright greenish yellow.

Mesothorax with a complete, almost parallel-sided, dull bronze-black middorsal band occupying the inner halves of mesepisterna, the middorsal carina and ante-alar triangles being also black; outer halves of mesepisterna lighter, forming a dark ferruginous brown juxtahumeral band equal in width to the black middorsal one, this coloured area acquiring a much lighter tint upon lower 1/4 of mesepimera in the form of an



Figs. 5—6. Male appendages of Platyncnemididae in dorsal and left lateral view. — 5, *Rhyacocnemis prothoracica* spec. nov.; 6, Unnamed species, "72×040" collection of Donnelly.

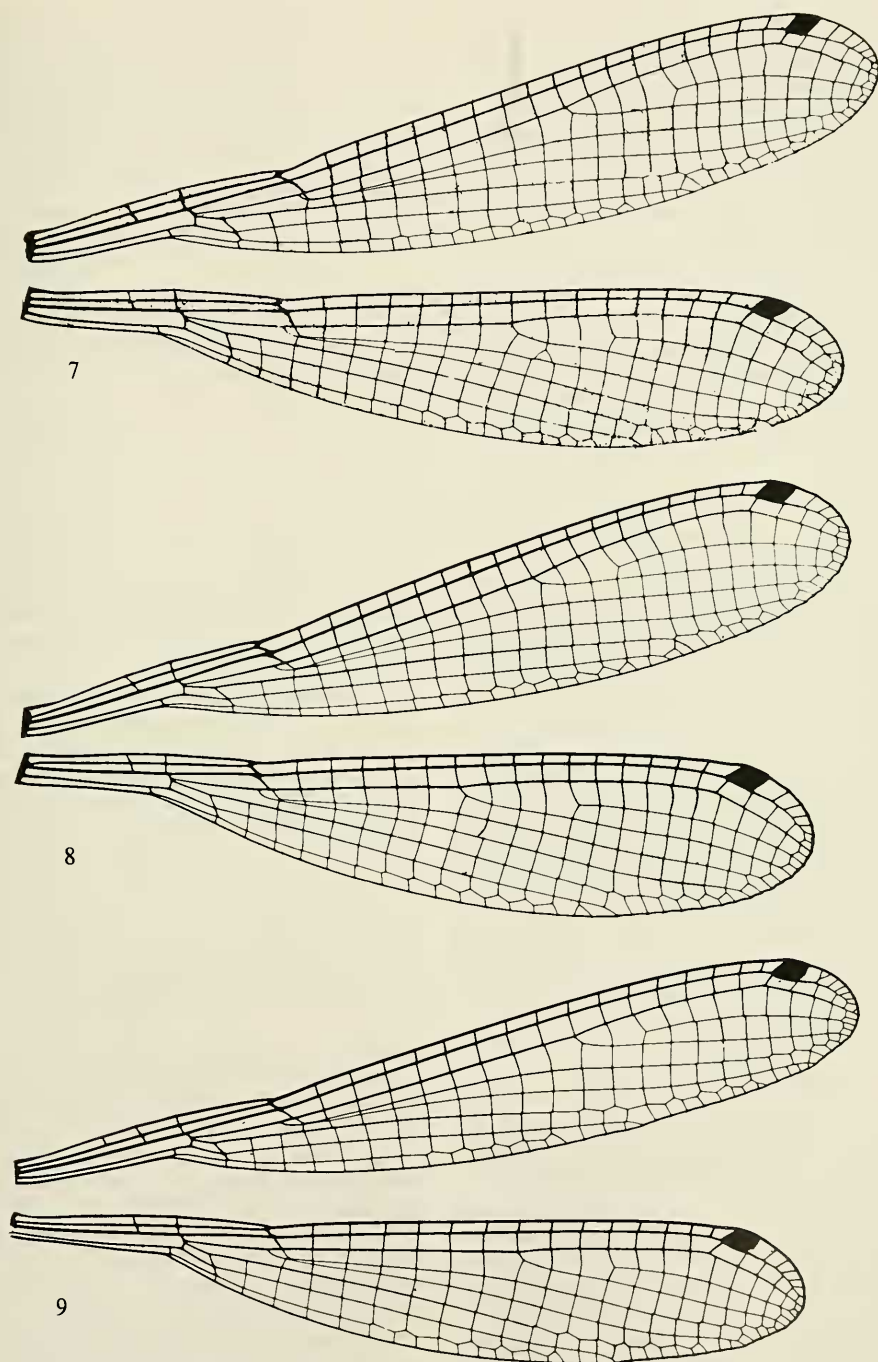
elongate patch of bright chrome which is continued ventrad upon the mesostigmal laminae. A black line, broadening at lower end to occupy most of the mesinfraepisternites as well, accentuates the humeral suture. Sides, as far down and just including the metaspiracle, bright chrome intermingled with light green; behind this, an almost equally broad but very irregular band of rusty dark brown runs over the second suture, expanding ventrad to cover also most of the metinfraepisternites; rest of metepimeron distinctly light blue, the lateroventral carina and whole ventral surface of thorax, pale yellow; poststernal plate almost bare, but provided upon its middle with a compact patch of many longish, dark, stiff bristles placed upon a distinctly swollen part of the sclerite, the setae making up this paintbrush-like tuft being directed straight back though remaining well visible in profile view.

Legs thin and slender, hind femur reaching back to a little beyond halfway length of first abdominal segment; femoral bristles 11—12 each side, longest on hinder pair, almost three times the interspaces but decreasing in length toward base, 8—9 on mid and fore femora; tibial bristles longer, 7—8 in outer row of hinder pair; tarsi slender, the claws with small but

acute subapical inferior tooth. Colour of all coxae and trochanters blue-green, outer faces of all femora with a thick black stripe broadening gradually toward end including the knees, inner faces bright chrome darkening toward apex; all tibiae and tarsi black but claws yellowish.

Wings (fig. 8), narrower with more pointed tips than in both *Idiocnemis* and *Paramecocnemis* (figs. 1, 2), shape and venation very similar to *R. sufficiens* (fig. 7), the undulations of post-pterostigmal border slightly more pronounced than in the latter but not less so than in *Idiocnemis*; neuration black. Pterostigma oblique, a trifle longer than high, dark brown heavily framed in black. Wing bases with all axillary sclerites as well as the meso- and metanota strikingly coloured a brilliant sky-blue.

Abdomen (end segments fractured), very slim and slender but not unusually drawn out and lacking conspicuous hair tufts on any of the tergites such as seen in both species of male *Paramecocnemis*. Structural peculiarities are (1), postero-lateral edge of tergite 2 produced backward, ending in a short triangular lobe (instead of normally cylindrical and parallel-sided in *sufficiens*), its lower border sparsely beset with golden yellow setae; (2), Antero-lateral edge of tergite 3 with a short, nipple-shaped protuber-



Figs. 7—9. Wings of Platynemididae. — 7, *Rhyacocnemis sufficiens* Lieftinck, 1956; 8, *Rhyacocnemis prothoracica* spec. nov.; 9, Unnamed species, "72×40" in Donnelly collection.

ance directed laterad (this tergite normal in *sufficiens*); intermediate segments thin and needle-like, but from end of 7 on gradually expanding in both dimensions, 8 about one and one-third times longer than 9, the latter squarish and parallel-sided, 10 short and broad. Almost wholly black; tergites 1 and 2 conspicuously marked with sky-blue and bright ochreous: distal half of 1 blue, finely interrupted by black in the median line, this stalk attached to a narrow black apical ring; 2 on either side with complete, thick, bright chrome lateral bar occupying lower portion of tergite; next segments, inclusive of the anal appendages, apparently all black (tergites 8 and 9 possibly discoloured and partly blue in life?), save merest traces of obscurely coloured basal annules and a yellow line bordering ventral margin of tergites 3—7. Directly from below mid-apical border of tergite 10 projects a slender, rod-like cylindrical process whose apex is subtruncated and a little incised.

Anal appendages as in fig. 5; superior pair about equal in length to the subquadrangular 9th segment, at first outcurved and bluntly toothed on the inside near base, then broadening, bent inward and somewhat flattened, strongly transversely ridged on uneven ground, inner border in dorsal view irregularly sculptured and toothed, outer faces of basal portion of each beset with short and strong spike-like denticles interspersed with longish hairs (only partly shown in dorsal view and omitted inside view sketch). Inferior appendages well developed but attaining only half the length of superior pair, basal portion of each broad and rather swollen, then rather suddenly narrowing and somewhat curved toward each other, gently tapering to slightly upcurved tips.

Salomocnemis gen. nov.

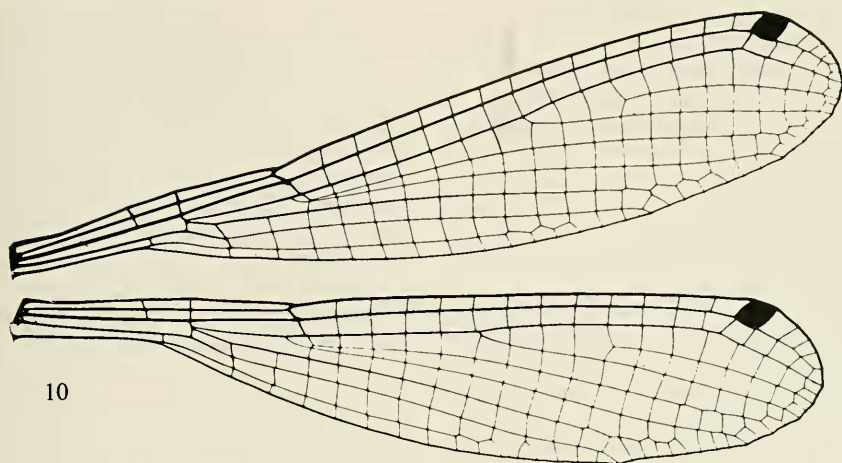
Stature of *Lieftinckia*, but with a broader head and more bulging eyes. Labium similar, the median emargination equally small but less narrow, the limbs of the U distinctly diverging instead of subparallel. Shape of mouth-parts and face much as in *Lieftinckia salomonis* (the type-species), but all parts comparatively a little broader. Anteclypeus forming a right angle with the postclypeus, the latter distinctly carinate anteriorly. Frons obtuse-angulate anteriorly with well-pronounced though rounded, transverse ridge, instead of gently sloping down and rather flattened in *Lieftinckia*; frontoclypeal suture broad, impressed, rectangulate, the sulcus be-

tween antennal sockets likewise distinctly impressed. Inner orbital line straight (not convex), strongly converging anterad on dorsal as well as on ventral surface of head (parallel-sided ventrally in *Lieftinckia*). Antennal sockets but little raised but distinctly swollen; scape only slightly longer than its socket, thick, cylindrical, little more than twice as long as broad; pedicel more slender and rather clubbed apically, subequal in length to scape; segment 3 thinner and about one-fourth shorter than pedicel, remaining segments about equal in length to scape and pedicel united. Vertex small, raised, ocelli in equilateral triangle. Occipital ridge subacute.

Prothorax not modified, pronotal tubercles raised, conical; posterior lobe broad, surface convex, rather dome-shaped, side-angles rounded off in both sexes. Legs much shorter and less slender than in *Lieftinckia*; hind femur not nearly attaining apex of 2nd abdominal segment; armature as in the allied genus, but all femoral and tibial bristles comparatively a little shorter; tarsal claws with distinct subapical inferior tooth only little shorter than the claw itself.

Wings less abruptly petiolated, more evenly broadened and with more open neuration than in *Lieftinckia*. Nodus situated more distad, approximately one-third of the distance from base to apex. Arculus at Ax₂; Ac placed distal to Ax₁ instead of far proximal to that level in *Lieftinckia*; petiolation of the wing as in that genus ending at a point where Ab meets the wind border, but Ab and Ac coincident at margin instead of far apart, Ab occasionally terminating slightly proximal to Ac, almost at level of Ax₁. Rs at or slightly distal to subnodus, M₃ well before that level, the distance separating them at origin shorter in fore wings than in hind wings. Two postquadrangular antenodal cells. Quadrilateral hardly broadened distally, costal side much longer than distal side, especially in hind wing. Medio-anal link entire, or almost so. Wing border of whole apex posterior to pterostigma, back to termination of Cu₁, slightly but distinctly undulated (most marked on hind wing). A single row of cells between C and R₁ beyond pterostigma. Pterostigma rather swollen, almost square, covering one underlying cell.

Abdomen slender, basal and terminal segments moderately inflated. Proportionate lengths of segments as in *Lieftinckia*. Colour pattern much as in that genus. Vesica spermalis of ♂ penile organ not prominent, suboval, thin and plate-shaped in profile view, membranous



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Fig. 10. Wings of *Salomocnemis gerdae* spec. nov. (Guadalcanal).

in the centre, but with strongly sclerotised lateral rims; ligula (penis) shaped as in fig. 15; no shaft spines. Male anal appendages of rather simple structure, resembling *L. salomonis*. Eighth abdominal sternite of female simple, without any indication of an apical spine; genital organs normal, valves surpassing tenth segment and tuberculum anale for about the same length as the former, lower margin of outer valves finely denticulate; cerci short and blunt, flattened dorsoventrally.

Type-species: *Salomocnemis gerdae* spec. nov.

Habitat: Solomon Is. (Guadalcanal).

***Salomocnemis gerdae* spec. nov.**
(figs. 10, 14—16)

Material. — Solomon Is.: 2 ♂ 1 ♀ (1 ♂ subadult), one pair of juveniles, Guadalcanal I., Komugelea, 1200 ft., "in forest", 22.ix.1965, R. Slooff and Gerda Stanny Slooff-de Vries (all ML).

Male (subadult, holotype). — Head with labium palest yellow, mentum and centre of median lobe semitransparent, colourless. Mandible-bases dark yellow-green, the teeth black. Labrum, clypeus, genal area and frons, dark olive-green, rather shiny; all the rest of dorsal surface of head, including the antennae, similarly coloured but dull, sparsely marked with light brown, as follows: a minute central spot in the depth of ante-ocellar depression, basal half of antennal pedicel, a crescentic spot to the inside of each lateral ocellus, and a vestigial spot upon

middle of occipital ridge; a curved black line extends inward on either side of middle upper orbital margin as far as outer end of occipital ridge, the upper part of the postocular area behind this line being olive-green, the lower portion dark brown fading to dirty yellowish underneath.

Prothorax, inclusive of anterior and posterior lobes, dull orange, growing paler and intermingled with light green laterally; pronotal tubercles little elevated, rounded; posterior lobe depressed, at least four times broader than long, surface slightly convex and undulated, its posterior border a little upturned, almost straight, side-angles rounded. Synthorax orange, deepest in tint at the humeral suture but becoming lighter with admixture of pale green upon lower portions of epimera and infraepisterna; dorsum, to a little in advance of humeral suture, olive-green; mesoprescuta orange, with deep black speck on either side of the triangles, the latter also orange but with their borders deep black, as are the postero-dorsal edges of the metepimeron.

Legs with coxae and trochanters palest orange, for the rest light greenish to greyish yellow; apices of all femora and last tarsal segments, narrowly ringed with brown; all bristles and teeth of tarsal claws brown.

Wings hyaline, the open neuration black, only the petiole somewhat more palely veined. Whole margin of wing apex posterior to pterostigma with a number of small but distinct undulations, the posterior border of hind wing

moreover noticeably protruding at a point where M_3 and Cu_1 enter the margin. Fore wing with 14, hind wings with 12 Px of first series; Rs arises very slightly distal to subnodus, M_3 well proximal to it; M_2 at Px_7 in fore wings, a little beyond Px_5 in hind pair; M_{1a} three and four cells further distad, respectively. (In all fore wings and in four out of six hind wings, the anal bridge terminates even a little proximal to Ac, which in the female is placed under Ax_1 instead of slightly distal to it).

Abdomen, ground colour yellowish, distal portions of tergites 3—7 marked indefinitely with brown, this colour progressively becoming more extensive and darker posteriorly; hind margins of 1—2 finely ringed with black and each with a dark middorsal line; basal 1/3 to 2/5 of 3—7 yellow, passing gradually to brown posteriorly, the apical rings deep black; 8 black, 9 brownish black mottled with yellow, dorsum of 10 entirely yellow, the sides greenish with a deep black streak alongside middle of posterior border.

Anal appendages (fig. 14), superior pair triangular, acutely pointed, inner faces of each rather flattened, the basal portions also triangular, directed obliquely mesad and ventrad, tapering to a blunt black-tipped process visible only in caudal view; inferior appendages also yellowish, rather longer, strongly hollowed out within, the apices of each incurved, squarely cut off and furnished with a row of five black denticles.

Female (juvenile). — N.B. Where not mentioned in the description of the male, most of the next details of structure also apply to that sex.

Resembles the male in most respects. Mouthparts in better condition than in the available males. U-shaped median emargination of labium elongate, about 1/5 total length of midlobe, the U itself parallel-sided; colour of whole structure as well as mandible-bases, palest chrome. Labrum porrect, slightly more than 1/2 times broader than long, widest at middle, its surface convex, smooth. Structure of all upper parts of head and antennae as described for the male, coloration a pale creamy yellow inclusive of the sockets and scape of antenna, the pedicel and third joint being grey-black, for the rest distalia again lighter. Postocular area cream, except its anterior suture finely deep black; occipital region gradually changing to brown.

Prothorax much as in male: surface smooth, pale ochreous almost throughout; anterior lobe broad, of the usual shape, subequal in width to

the posterior one but strongly swollen in side view, moderately raised, its front border thickened, straight-lined and subacute in dorsal view, but protuberant in side view, with pair of deep black transverse rims one each side; pronotum with three pairs of somewhat convex, roundish tubercles placed in the long axis, the outer pair largest, the innermost pair diverging anterad but fused together in the median line posteriorly, the outer tubercles covered with extremely minute, finely pointed tubercles; transverse sulcus separating them from posterior lobe moderately deep, surface irregular. Posterior lobe of prothorax quite simple, not at all modified, mid portion somewhat raised, bow-shaped in caudal view, the whole structure about 4—5 times broader than long, hind margin subacute, almost straight at middle in dorsal view, sides gently rounded, hardly downcurved.

Mesostigmal laminae small, subtriangular, yellow, each with a raised, deep black inner rim placed in the long axis, lateral parts triangularly tapered (fig. 16). All colour marks on dorsum of synthorax ill-defined, pale chrome with faint greenish hue: a pair of wedge-shaped antehumeral bands, widest below, tapering and bluntly pointed upward, on a pale ferruginous ground, this colour extending laterad to almost halfway metaspiracle; ante-alar triangles lighter but finely black-rimmed, as are also the dorsal ridges of mesopleurae, a speck at upper end of second suture, and the posterior borders of the metepimeron.

Legs throughout light greenish yellow, the femoral banding hardly indicated; all spines and bristles obscured; tarsal claws as described for the male; with small but distinct, sharply pointed dark inferior tooth very near the apex proper.

Wing neuration light brown, membrane hyaline. Venation, inclusive of the relative positions of Ac and origin of M_3 — Rs as well as shape of pterostigma almost exactly as described for the male (fig. 10), but differing from the latter in that the wing tips are more bluntly rounded, the post-pterostigmal as well as the underlying cells being markedly higher, those of the latter being subquadrangular or even higher than long (instead of the reverse in two males). Also, the marginal undulations at wing tips and end of main veins, are distinctly more pronounced than in the opposite sex. Pterostigma dark grey, contrastingly framed in bright yellow.

Abdomen slender, of the usual shape, basal segments scarcely broadened, thereafter grad-

usually a little expanded toward the end (immature specimen!). Ground colour cream, marked indistinctly with brown: traces of that colour on middorsum and sides of tergite 2, whole 4/5 of 3, 2/5 of 4—6, almost distal half of 7, and most of 8 including the valves; 9—10 as well as the cerci and tuberculum, all yellow. Genital valves rather long, projecting beyond apex of abdomen, equal in length to lower margin of tergite 8; ventral border of valves only slightly convex in side view, apical 3/5 of each armed with a row of ca. 24—26 microscopical swollen tubercles gradually increasing in size toward apex, each of the most distal ones ending suddenly in a minute acuminate spine.

Measurements: ♂ abdomen + appendages 34.6 mm, hind wing 21.5 mm; ♀ abdomen (incl. valves) 33.1 mm, hind wing 21.4 mm.

Lieftinckia Kimmins, 1957

Lieftinckia salomonis Kimmins

(fig. 17)

Lieftinckia salomonis Kimmins, 1957: 312—315, fig. 1 A—G (♂ ♀ struct.), ♂ ♀ Guadalcanal. — Lieftinck, 1963: 527—530, 541—542 (♂ ♀ incl. key), 531—533 (♂ larval struct.), pl. 26 fig. 1 (♂ wings), tfig. 1—12 (♂ ♀ imaginal char. & larval struct.), ♂ ♀ Guadalcanal.

Additional material. — Solomon Is.: 1 ♀ (juvenile) Guadalcanal I., Tenaligi River 25.ix.1965, "heavy forest", R. Slooff (ML); 1 ♂ (adult), Guadalcanal I., Gallego, 11.vii.1965, "hidden valley, 2nd grass clearing", Roy. Soc. Exped. Brit. Mus. 1966 (BM); 1 ♂ 2 ♀ (sub-adult), Guadalcanal, Gold Ridge, 22.iii.1955 (♂) and Tsarivonga river, same date (♀), E. S. Brown (BM).

Male. — The Gallego specimen from Guadalcanal is the first full-coloured male of the type-species of *Lieftinckia*. Like so many other platyneimids, *salomonis* also passes through a series of colour phases before reaching maturity, the present case being a good example of this extraordinary variation. With its pale brown and cream-coloured body, the present male looks quite different from the immature insect. Labium obscurely red-brown, all the rest of the face vividly brick red as far upward as a little behind the ocellar triangle; thereafter the red changes abruptly to black in a line that runs from eye to eye, passing over the occipital crest, which itself is dark brown in the middle. Hind

portion of the postocular lobes and rear of the head, deep black except a triangular spot on the lower genal area. Dorsum of prothorax and upper part of its sides dull black, for the rest obscurely orange-red. Mesepisternites and antealar triangles black, almost lustreless, this colour passing beyond the humeral line for a short distance parallel to the suture but suddenly expands upward so as to occupy also the dorsal one-third of the mesepimeron. Sides and ventral surface of thorax bright chrome, only most of the infraepisternites rusty brown. Coxae and femora inclusive of the bristles, orange-red; outer faces of fore femora more obscured, knees also darkened; tibiae and tarsi reddish black.

Wing membrane suffused with grey-brown, pterostigma brownish black. Abdomen dark brown becoming black on the terminal segments; sides of 1 and those of 2 for the basal 2/3 part, ochreous; fairly distinct basal and subterminal spots of the same colour bordering the tergites laterally being also present on 3—6, these spots elongate and fused together on 7.

The three further Guadalcanal specimens (Tapenanje), are near topotypes collected in 1955. These were found unnamed in the British Museum collection years later than the examples of either sex discussed earlier by Kimmins (1957) and myself (1963).

I made the following brief colour note on the subadult male: "Head bright orange, dorsum of synthorax black, the sides and legs orange; abdomen obscured, the annules sharply defined, segm. 10 and anal appendages yellow".

Lieftinckia lairdi Lieftinck

Lieftinckia lairdi Lieftinck, 1963: 534—537, 542 (key ♂ ♀), pl. 26 fig. (♂ wings), tfig. 13—16 (♂ struct.), ♂ ♀ Guadalcanal.

Lieftinckia spec.? Kimmins, 1957: 315, ♀ Guadalcanal.

Additional material. — Solomon Is.: 1 ♂ (adult), Guadalcanal I., Sutakiki River, 23.iii.1955, E. S. Brown, no. 2605 BM 1957—201 (BM); 1 ♂ (sub-adult), Guadalcanal I., Nuhu, 26.x.1965, "slow flowing pool formed by seepage alongside river, by ford", Roy. Soc. Exped. Brit. Mus. 1966 (ex BM, ML).

Male (adult, Sutakiki river). — This is a near topotype, larger in size than the previously described immature specimens. The following details are noteworthy additions to the original description.

Prothorax shaped as in the immature insect but colours generally darker; posterior lobe more evenly bordered, showing no undulations such as seen in the juvenile males. Sides of synthorax red-brown, the meso- and metepimera predominantly light green. The subapical dark rings at the femora are broad but not sharply pronounced. Wings relatively shortly stalked, neuration likewise not differing from that originally described and photographed (loc. cit., 1963, pl. 26 fig. 2). Fore wing with 22—23, hinder pair with 20 Px of first series; M_3 arises just before the subnodus, Rs half a cell beyond that level. The short, narrow and very oblique pterostigma approaches *salomonis* most closely in shape.

Abdominal tergites mainly blackish brown, but dorsal bands much less constricted and contrastive with the light ground colour, than in *malaitae* spec. nov., described hereafter.

Measurements: abdomen + appendages 40.5 mm, hind wing 28.0 mm.

So far only known from Guadalcanal.

***Lieftinckia malaitae* spec. nov.**

(fig. 12)

Structurally very similar to *L. lairdi*, but obviously specifically distinct from that species.

Material. — Solomon Is.: 2 ♂ 1 ♀ (semiadult), Malaita I., Dala, 50 m, 9—14.vi.1964, J. & M. Sedlacek (ex BISH, ML); 3 ♂ (2 ad., 1 subad.), Malaita I., Ngwaiu, 1500 ft., 10.x.1967, R. Slooff (holotype ♂ and 2 paratypes, ML).

Male (adult, Ngwaiu). — Antenna long, almost equal in length to inner orbital line when viewed from above; scape short and cylindrical, little longer than broad, pedicel thin and much slenderer (apparently a little varying in length: in one paratype fully three times longer than scape), both segments pale in colour; distalia darkened, about as long as first two segments united.

Head, thoracic sclerites and legs, all more uniformly coloured than in *lairdi*, of a delicate cinnamon to light brownish orange, deepest in shade on top of frons, the ocellar region and on the thorax above; otherwise unmarked save minute dark lines and specks at the median carina, dorsal margin of mesepimeron, the uppermost edges of the pleural parts, and at the lateroventral angle of metepimeron. Whole ventral surface of thorax as well as the coxae, trochanters and femora, throughout pale, the ex-

treme tips and much broader subapical rings of femora brown, the latter distinct though not sharply outlined; tibiae, tarsi and bristles slightly more obscured than the femora.

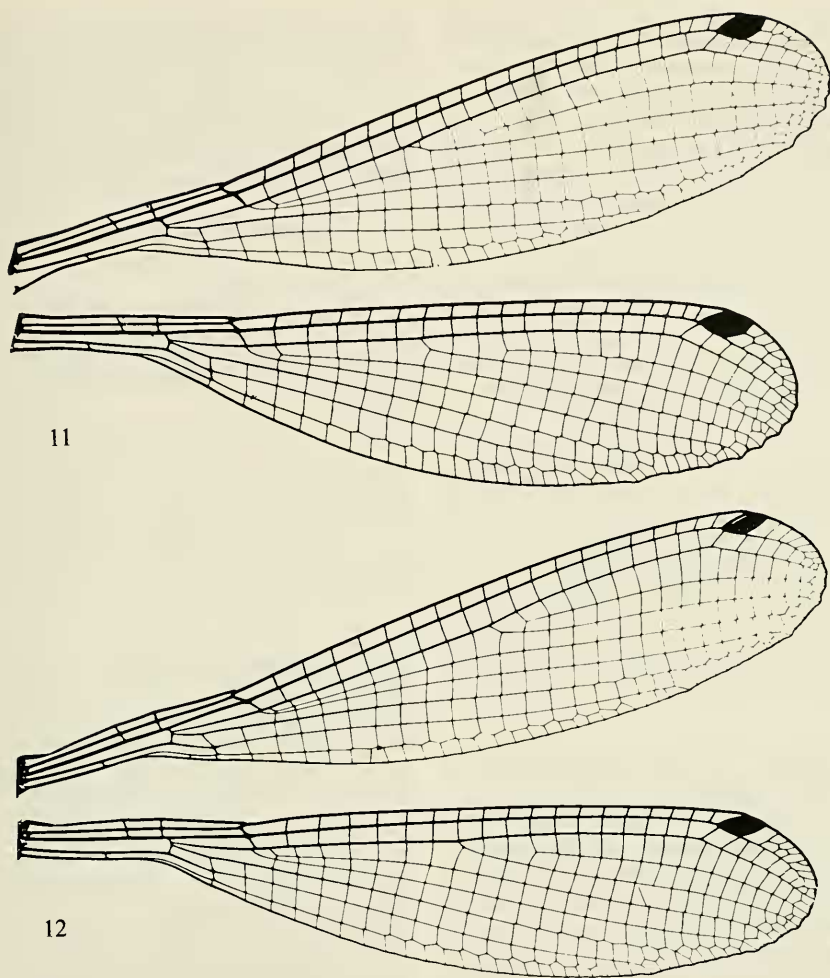
Shape and neuration of wings as shown in fig. 12, relatively narrow and elongated, more abruptly stalked than in *salomonis* and *lairdi*, the stalk also being longer than in the latter, while the pterostigma is slightly less oblique, higher and more nearly parallel-sided. Fore wing with 18—22, hind wing with 17—18 Px of first series.

Ground colour of abdomen light ochreous, but tergites 2—7 much more contrastingly marked with blackish brown than in any other species. Dorsal bands extending from base to apex, forming complete, fairly distinct marks, which toward the base of each tergite are rather pointed, leaving elongate yellow lateral spots, but distad are markedly constricted before becoming fused with well-defined black apical rings. Tergites 8—10 much obscured, only the sides usually broadly yellowish.

Anal appendages (not figured) yellow, the superiors darkened above, shaped much as in *lairdi*, but differing as follows: superior appendages triangular, rather inflated basally, as in *lairdi*, but more distinctly pointed apically; inferiors less strongly upcurved with the black tips sharply hooked inward and acuminate, instead of tapering gradually, as seen in *lairdi*. The robust interobasal spurs of the superior appendages are distinctly longer than in *lairdi* and wholly exposed in side view, at first directed straight ventrad, then gently curving cephalad; in caudal view these processes are directed toward one another, the apices meeting at their extreme tips, thus remaining uncrossed.

Female (subadult). — Resembles the male in most respects but differs in details of colouring and the better defined abdominal pattern. Mouth-parts pale yellow, the labrum mixed with light ochreous; face, the swollen antennal sockets, and an ill-defined broad area along inner orbits tending to palest green, the vertex surrounding the ocellar area and most of the occipital region behind it, dark cinnamon, this colour occupying most of the dorsal surface between the eyes posterior to the lateral ocelli. Antennae pale, shaped as in male, the long slender pedicel tipped with black. Ventral surface of head palest greenish yellow.

Pro- and synthorax light brownish yellow, rather darkened upon all upper parts: brown



Figs. 11—12. Wings of *Lieftinckia* species (Platynemididae). — 11, *L. isabellae* spec. nov. (Santa Isabel); 12, *L. malaitae* spec. nov. (Malaita).

becoming dirty orangish on the surface on either side of the humeral line, and still more diffusely so along the second suture, between these darkish areas is a band of pale yellowish green. Prothorax little modified, pronotal tubercles low, not at all prominent, their dorsal line in side view almost straight; anterior lobe raised, of the usual shape, its border simply convex; posterior lobe short and broad, shorter than the pronotum itself, slightly raised and almost straight-lined in dorsal aspect but hind border distinctly undulated with obtuse-angulate dorso-lateral edges, the little prominent lateral lobes small, narrowly rounded off.

Legs including bristles pale, femora ringed as in male, brownish.

Wings hyaline, the apical crenulations as distinct as in male. Fore wing with 19, hind wings with 17 Px of first series. Pterostigma shaped exactly as in the opposite sex, i.e. with sides more nearly parallel than in *lairdi*; colour pale grey-brown.

Abdomen slender but less so than in male, with cylindrical segments of almost even width, except the last ones very slightly expanded. Ground colour light ochreous, the dorso-lateral dark brown marks much more sharply defined, standing out more clearly than in male, as fol-

lows: tergite 1 only the raised posterior portion in front of the intersegmental halfring behind the transverse ridge, brown; terminal ring of 2 occupying slightly more than its apical one-third, this spot narrowly prolonged forward in the median line; dorsal marks of 3—7 more deeply constricted subapically than in male, pointing basad, becoming successively broader from before backward, the broad basal portions of light ground colour most conspicuous and largest on 2—4, subinterrupted before their fusion with the dark apical rings; brown and yellow areas of tergites 8—10 ill-defined, the yellow predominating. Valves not surpassing segment 10; cerci short, triangular and finely pointed, yellowish.

Measurements: ♂ abdomen + appendages 33.5—38.2 mm, hind wing 22.8—25.0 mm, the holotype male being the largest specimen; ♀ 32.5 mm and 24.0 mm, respectively.

Lieftinckia kimminsi Lieftinck
(fig. 18)

Lieftinckia kimminsi Lieftinck, 1963: 537-541 (♂ ♀ inclus. key), pl. 26 fig. 3 (♂ wings), tfig. 17—18 (♂ struct.), ♂ ♀ Bougainville I.

No fresh material.

This species is easily distinguished from its congeners by a combination of characters. It is chiefly remarkable for the well-defined bright blue head and thorax markings, and also by having a relatively large head (width across eyes and total body length in the ratio 10.2:100), which gives the insect a "facies" reminiscent of certain species of *Coelicia*. Shape of wings and venation similar to *lairdi*, but wings of the latter are slightly narrower and less abruptly petiolated (cf. Lieftinck, 1963: pl. 26, figs. 2 and 3). The pterostigma is rather like that of *ramosa* (fig. 13), distinctly less oblique, more regularly lozenge-shaped, than in *lairdi*. In both *lairdi* and *kimminsi* the posterior margin of the wing tips is strongly undulated, more markedly so than would appear from the published photographs (loc. cit., same figs.). The male superior anal appendages are equal in length to, or a trifle longer than, segment 10. When viewed from within, the appendage shows a peculiar armature, which is best shown in fig. 18. A broad, robust somewhat molar-like tubercle is placed about midway its whole length, at the base of the finger-like downpointing process; this tubercle is subrectangular in outline, with shal-

lowly emarginate margin, its main portion being bluntly triangular and about equal in size to the true apex of the appendage. In these respects *kimminsi* differs from *ramosa*, in which the interior process is considerably smaller, while the true apex of the superior appendages is longer and more slender (cf. figs. 21 and 22).

Lieftinckia isabellae spec. nov.
(figs. 11, 19)

Material. — Solomon Is.: 3 ♂ (two adults, one headless, one subadult), Santa Ysabel I., Maring Distr., Ta Matahi, 2.vii.1960, C. W. O'Brien. Holotype ♂ adult and one paratype ♂ (ML), one paratype ♂ (BISH).

Stature more robust than *lairdi* and the larger-sized *kimminsi*, with a shorter and more compactly built synthorax, narrower wings, more normally lozenge-shaped pterostigma, lighter coloured end segments of abdomen, and quite differently shaped anal appendages.

Male. — Labium yellowish, palpi ferruginous, emargination of midlobe roundish, U-shaped, its depth less than ¼ whole length of mentum. Labrum, mandibles (save the tips light ferruginous), anteclypeus and whole genal area, deep brownish black mixed with ferruginous, surface of all parts brightly shining. Postclypeus subhorizontal, its anterior 2/5 deep black, this mark widest at middle and convex behind, the anterior ridge sharply pronounced; colour otherwise bright chrome to orange (full coloured male), whole surface shiny, the light colour surpassing fronto-clypeal suture and continued upward to form a complete broad transverse band of orange extending from eye to eye, occupying the frons as far dorsad as the rather swollen black antennal sockets. Rest of the head above, inclusive of the occipital ridge, unicoloured dull velvet brownish black; rear of head otherwise ochreous. Antenna rather shorter than upper orbital line; scape short and cylindrical, only little longer than its own diameter, black with slight greenish hue; pedicel much more slender, subequal in length to scape but about twice as long as its diameter, colour yellowish; flagellum indistinctly segmented, black.

Main body of prothorax much shorter than in *kimminsi* and *lairdi*, hardly twice as long as its anterior lobe, the latter shaped similarly though much larger in size; pronotal tubercles weakly convex in side view, relatively larger and broad-

er than in the two species mentioned but of the same simple collar-like form, the side-edges narrowly rounded off.

Synthorax distinctly shorter and more expanded than in both *kimminsi* and *lairdi*. Colour-pattern a soft light rusty brown variegated with a mixture of delicate cream-yellow and pale green, the latter forming incomplete, ill-defined antehumeral bands tapering upward, separated above from a pair of almost conjoined juxtahumeral patches of the same colour, one placed before, the other just behind the suture; metapleurae marked with two, almost complete light bands, both ill-defined but of the same tint as the dorsal spots, separated from one another by an equally diffuse rusty brown band over the second suture. Whole ventral surface of thorax uniform pale ochreous, this tint turning to light green only along ventral metepimeral ridge.

Legs throughout light rusty brown, as on most parts of the thorax, posterior femoral ridges finely black from near base to apex, the knees and extreme base of tibiae, distinctly ringed with dark brown, diffuse lighter brown annules placed slightly beyond halfway length of femora also discernible in two out of three males; colour of tibiae and tarsi as well as all bristles somewhat more obscured than on the femora; hind femur long, reaching back to very slightly over the apical border of segment 1, with 11–12 long bristles in outer row.

Wings notably longer in proportion to the relatively short and very slender abdomen: fore wing when folded attaining base of segment 7; shape and venation as in fig. 11; marginal undulations of apical portion quite distinct; veins almost black, membrane subhyaline. Arculus at Ax_2 in all six wings; M_3 arising at or a trifle distal to the subnodus, Rs at Px_1 ; anal bridge reaching the wing border at level of the prolongation of Ax_1 or slightly distal to that point. Fore wing with 21–22, hind wing with 18–19 Px of first series. Area enclosed by C and R_1 posterior to pterostigma irregularly veined: very rarely with only a single cell-row, usually made up of more than 2 (1–6) duplicated cells (fig. 11).

Abdomen slender, though relatively a little shorter than in both *kimminsi* and *lairdi*, from segment 7 on gradually somewhat expanded. Colour much as described for the other congeners: tergites bright yellow to dusky ochreous (depending on the state of maturity), but greater part of 2–6 much darker dorsally, brown to almost black from end to end, the light parts

forming more or less distinct basal rings, except 1 unmarked and basal one-third of 2 also remaining yellow, its dorsal black mark pointing forward; 8–10 and anal appendages pale, lacking dark areas, only 7 occasionally obscured upon middle of tergite.

Anal appendages short and compact, shaped as in fig. 19.

Measurements: abdomen + appendages 33.8–35.2 mm, hind wing 22.5–24.5.

Female unknown.

***Lieftinckia ramosa* spec. nov.**

(figs. 13, 20–23)

Material. — Solomon Is.: 1 ♂ (holotype, adult, right hind wing and apex of left fore wing missing), San Jorge islet, off Santa Isabel, 26.ix.1965, "*Casuarina* forest, low herbage near stream", Roy. Soc. Exped. Brit. Mus. 1966 (BM) ["small island to the SW of Santa Isabel separated only by a small channel, but has a slightly different geological formation", pers. comm. by Peter Ward, BM]. — 1 ♂ (adult, paratype), labelled "*Idiocnemis inornata* Selys Bougainville", in R. Martin's handwriting (ex MP, in ML).

Male (holotype, San Jorge). — Labium dark brownish orange. Labrum, mandibles, genal area and anteclypeus obscurely reddish black, very shiny; postclypeus (with the anterior border remaining black) bright shiny orange-rufous, as are also a pair of trapezoidal spots, one each side, connecting edges of postclypeus with inner orbital margin in front of antennal sockets, which are dull black; frons, antennae, vertex, epicranium and occipital region, all lustreless deep black, only a small area next to the foramen on postocciput somewhat lighter, reddish black. Antenna black, scape thick, squarish, the pedicel more slender, cylindrical, but only $1\frac{1}{4}$ times as long as scape; distalia missing.

Prothorax, including anterior and posterior lobes, reddish black above, the sides throughout deep chrome; pronotal tubercles low, evenly convex; posterior lobe broad, not modified, depressed, almost straight behind, but distal border distinctly upturned, with rounded side-angles.

Synthorax predominantly dark rufous intermingled with vinaceous brown, variegated with paler vinaceous and yellow areas which are nowhere sharply outlined; black are: mesoprescutum, middorsal carina, margins of ante-alar triangles, and shiny black dots at all dorsal ridges inclusive of lateral sutures and posterior edge of

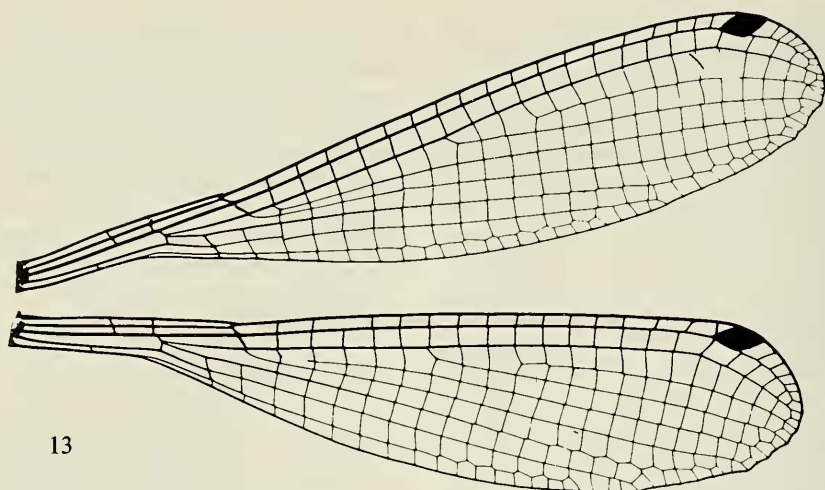


Fig. 13. Wings of *Lieftinckia ramosa* spec. nov. (Bougainville).

metepimeron. Mesepisterna with faint indication of lighter antehumeral bands, which are broadening and somewhat better defined upward to form definitely yellow, subcircular dots; sides with some lighter colouring dorsally upon the mesepimeron and a wedge-shaped chrome-yellow streak, pointing upward, along mid portion of first suture, the latter not quite reaching metaspiracle; some yellow also on middle of mesinfraepisternum and posterior edge of metepimeron; ventral surface pale.

Legs light rufous, but coxae paler and all femora with ill-defined, broad, brownish rings and dark brown apices; all spines and bristles rufous.

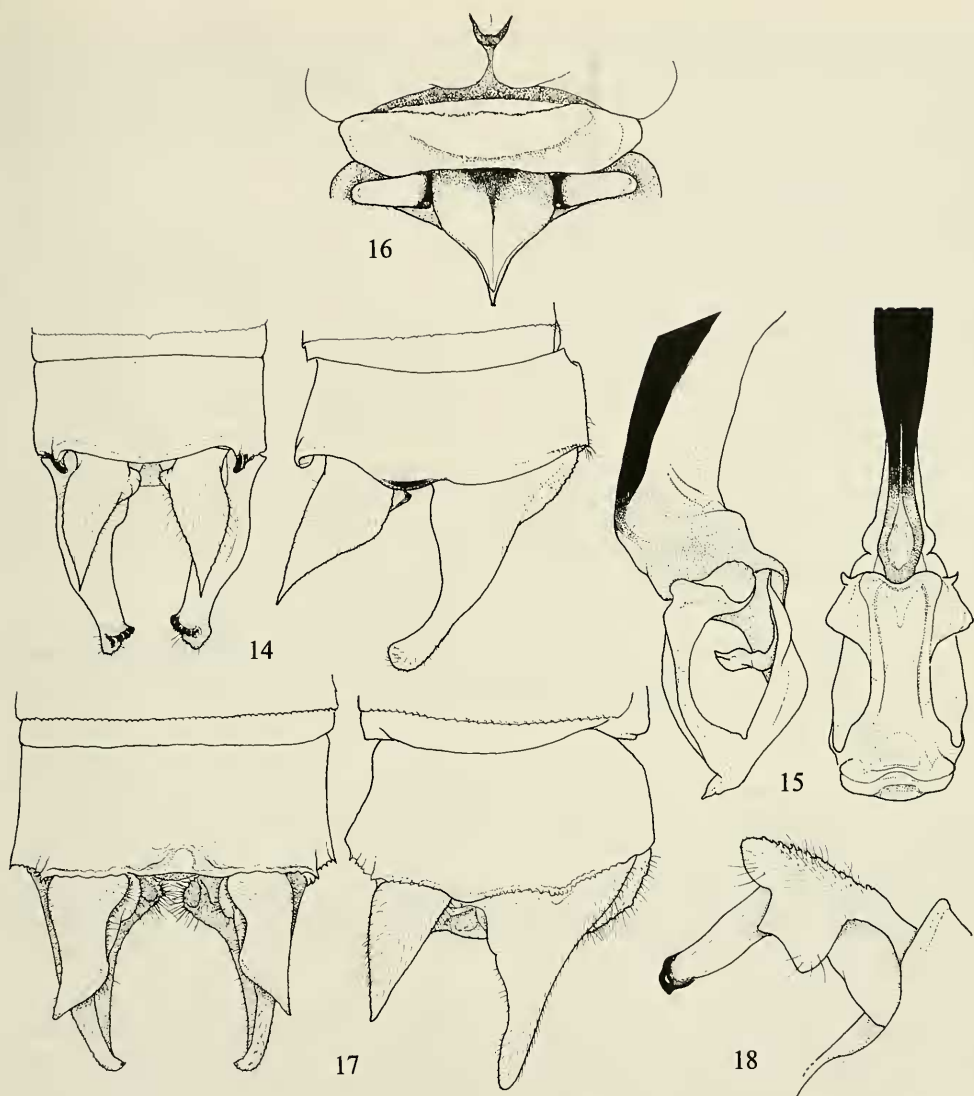
Shape and neuration of wings almost exactly as shown in fig. 13, for the male from Bougainville, but pterostigma a little more oblique and higher than in the type, its costal side distinctly shorter than the proximal, and distal side convex outwardly. Fore wings with 18, one hind wing with 17 Px of first series; arculus distinctly distal to Ax₂. Pterostigma dark reddish brown.

Abdomen very slender, terminal segments, from base of 8 to end of 10 gradually broadened, shaped much as in fig. 20. Colour mainly dark brown, segment 1 pale ferruginous above, the raised posterior border obscured and the sides also somewhat darkened; 2 obscurely brown with a diffuse yellowish basal annule and an indistinct stripe of the same colour along lower margin of tergite; 3—7 dark brown deep-

ening gradually to almost black posteriorly, each showing low metallic lustre above and all with small but fairly distinct yellow basal rings, prolonged caudad alongside for a short distance, those on 3 and 7 narrowly interrupted by brown at the middorsal line; intersegmental rings obscured but on 3—6 preceded laterally by minute, ill-defined yellowish apical spots; dorsum of 8 lighter brown, its sides more broadly ferruginous; 9—10 and anal appendages entirely brownish orange to ferruginous, the swollen postero-lateral border of 10 with a black streak.

Anal appendages as in fig. 20; apices of inner spur of superior pair as well as the incurved tips of the inferiors, black.

Male (paratype, Bougainville). — Resembles the type in most respects, but differs slightly in body colour and structure of appendages, as follows. Glossy surface of anterior parts of head uniform dark rufous instead of almost black, transverse clypeal band rather more orangish, less defined, and all the rest of head including antennae and undersurfaces, rufous, lacking dark areas. Pro- and synthorax as described for the type, except that there are no definite yellow areas on the mesepisterna, which instead bear a pair of complete, narrow and straight, cinnamon-coloured antehumeral stripes not strongly contrasting against the dark orange-rufous ground; sides with faint indication of a greenish superior spot just below dorsal crest of mesepi-



Figs. 14—18. Platycnemididae. — 14, Male anal appendages of *Salomocnemis gerdae* spec. nov., dorsal and right lateral view; 15, Idem, ligula of male left lateral view and ventral view; 16, Idem, mesostigmal laminae of female; 17, *Lieftinckia salomonis* Kimmins, male anal appendages, dorsal and right lateral view; 18, *L. kimminsi*, left superior appendage, innerside.

meron, also traces of light green on infraepisternite and lower edges of metepimeron. Legs badly damaged and broken.

Wings (fig. 13), venuration brown. Fore wings with 18, hind wings 15—16 Px of first series; pterostigma brown.

Abdomen shaped and coloured as in the type, except tergite 8 also showing traces of a latero-

basal yellow spot. Anal appendages (fig. 23), very similar to those of the type, but lower branch of superiors slightly thicker and shorter, forming an angle of about 80° with the main branch (obtuse-angulate in the type), and inner tubercle about halfway length of superior appendages a little less pronounced.

Measurements: ♂ abdomen + appendages

31.3 mm, hind wing 20.2 mm (San Jorge); 30.4 and 20.0 mm, respectively (Bougainville).

Female unknown.

This very distinct species has no near allies among its congeners inhabiting the Solomon chain but it approaches *kimminsi* most closely by having only a single row of cells between the veins C and R_1 beyond the pterostigma, and by having a branched apex of the superior appendages. It differs, among other characters, from both *kimminsi* and *lairdi* by its more abruptly petiolated wings, less pointed wing tips, and the quite characteristically shaped and coloured head and thoracic markings.

I am not quite certain about the correctness of the locality "Bougainville", as written on the label by R. Martin himself. In fact several instances are known of Odonata in Martin's collection whose reported habitats later proved to be erroneous.

Lieftinckia spec. indet.

Material. — Solomon Is.: 1 ♀ (subadult), San Cristoval I., Wainoni, 22.vii.1965, Roy. Soc. Exped. Brit. Mus. 1966 (BM).

This species is no doubt a near ally of *L. salomonis*, but apparently quite distinct. Although the shape of the prothoracic hind lobe with its lateral blades and the peculiarly inflated mesoprescutum are developed similarly to those of *salomonis*, the mesoprescutal outgrowth in the present specimen is much narrower and sulcate medially, while the posterior lobes of the prothorax are subtriangular in outline. The colour-pattern also resembles that seen in *salomonis*; and, like that species, there are two cell-rows between the nervures C and R_1 beyond the pterostigma. This San Cristoval insect is, however, a good deal smaller in size than *salomonis*.

By the absence of a topotypical male I prefer to leave this species unnamed.

Lieftinckia spec. indet.

Material. — Solomon Is.: 1 ♀ (juvenile, left hind wing missing), San Cristoval I., Camp 2, 24.vii.1965, Roy. Soc. Exped. Brit. Mus. 1966 (BM).

This ♀ belongs to another undescribed species left without a name. It is immature and in rather poor condition.

Posterior lobe of prothorax trapezoidal, rath-

er saddle-shaped lacking projecting side-lobes; no mesoprescutal outgrowths. Only a single row of cells between C and R_1 beyond pterostigma.

Size small: abd. 31.5 mm approx., hind wing 22.5 mm.

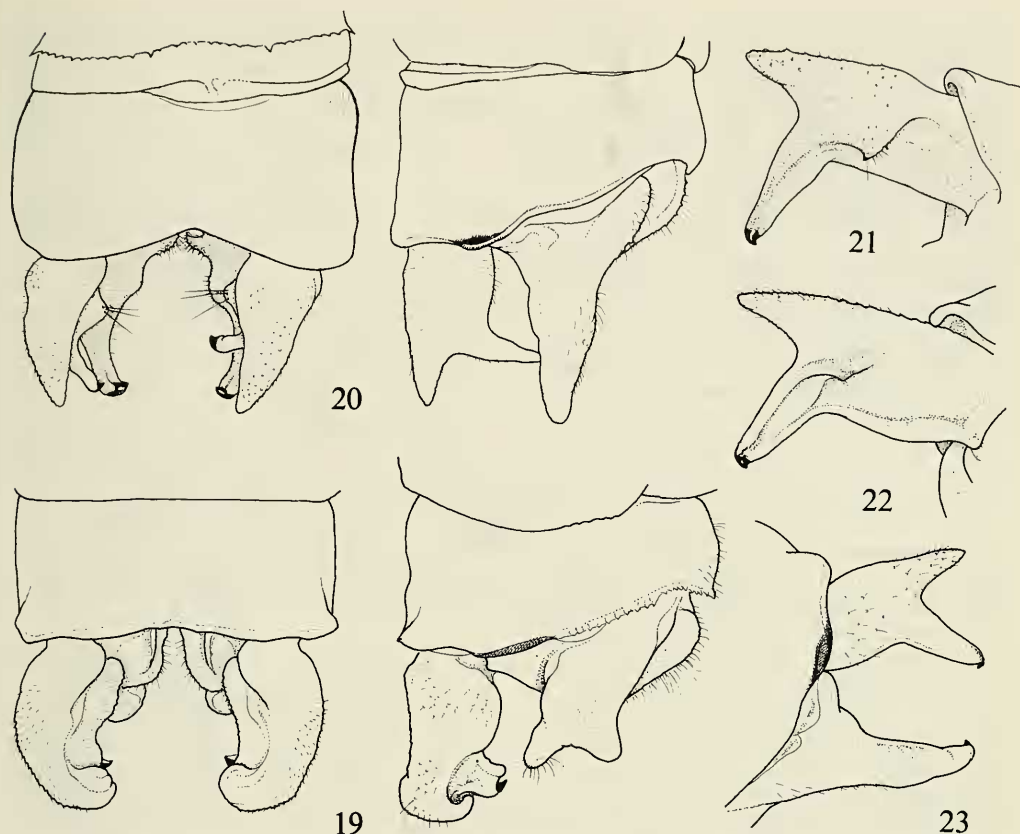
COENAGRIONIDAE

Teinobasis Kirby, 1890

Teinobasis is a fairly large genus with over sixty named taxa and probably more than twenty still undescribed species and subspecies. The genus is wide-spread all over southern S.E. Asia, Micronesia, the Melanesian islands, and the northernmost parts of Australia. Only two or three outlying members, doubtfully generically distinct from *Teinobasis*, are known from Malawi, a country on the verge of Ethiopia proper, and the Malgassian subregion (genus *Seychellibasis* Kennedy, 1920).

At the time of summarizing the regional species of *Teinobasis* (Lieftinck, 1949), no members other than *T. aluensis* Campion and *rufithorax* (Selys), had been known to occur in the Solomon Islands. On that last occasion, three more species were added to the list, but all were based on single specimens: two on immature females and the third on a male erroneously attributed to *Papua-grion* Ris, 1913. In the present paper all of them are revised, partly synonymized, and their structures more properly analysed. This has led to the recognition of 8 species (including one left without a name), of which the following 7 are believed to be validly named, viz., *T. aluensis* Campion, *bradleyi* Kimmins, *chionopleura* spec. nov., *imitans* spec. nov., *obtusilingua* spec. nov., *rufithorax* (Selys), and *simulans* spec. nov. As to the most widely distributed and best known *rufithorax*, this is only briefly mentioned in the next pages and will not concern us here any further. All others are probably endemic to the Solomons.

Insufficient acquaintance with *T. aluensis* must be held responsible for my erroneous assignment of *gurneyi* to a new species of *Papua-grion* Ris, 1913. The latter is a Papuan genus closely related to *Teinobasis* but with a more restricted range, comprising many, generally more sturdily built damselflies centred in New Guinea. Considering all characters used to separate these two genera (Lieftinck, 1932, 1935, 1937-38, 1949), and after re-examining the type-species, I arrived at the conclusion that *T.*



Figs. 19—23. Male anal appendages of *Lieftinckia* species. — 19, *L. isabellae*, dorsal and right lateral view; 20, *L. ramosa* spec. nov., dorsal and right lateral view (San Jorge); 21, *L. ramosa* spec. nov., innerside of superior appendage (San Jorge); 22, Idem (Bougainville); 23, Idem, left lateral view (Bougainville).

aluensis, *emarginata* and *gurneyi* should be reunited and placed in *Teinobasis*, the last two being obviously conspecific with *aluensis*, i.e. the earliest described member of this insular group. They were also compared with a few more recently discovered species, mentioned above and described below as new. They form a closely interrelated group differing markedly in details of structure and venation from *Papuagrion* (for references, see above). With the exception of the smaller-sized ones amongst the new taxa, two of them, *simulans* (New Georgia) and *imitans* (Guadalcanal), come very near *aluensis* and with much more material may even turn out to be only insular subspecies of the latter. As only few specimens are available for comparison, and no representatives of the *aluensis* cluster have so far been discovered in the intervening islands of

the Solomons, questions of subspeciation and relationship cannot yet be answered. In the present case it seems best to keep all taxa apart as full species. It should be borne in mind that all of them exhibit a certain amount of variation in body colour and extent of markings, a well known disadvantage mainly depending on the insect's stage of maturity, — in fact a real handicap frequently hampering easy recognition of similar-looking species of *Teinobasis* and allied genera!

In the present context a few remarks are perhaps worth attention bearing upon the intricate and diversified structure of the end segments of the male abdomen, especially with regard to the conjunction and flexibility of their relation to one another. These sclerites, with their appendages, are most complex in certain genera pres-

ently still united in the subfamily Pseudagrioninae (Davies & Tobin, 1984), a very large and heterogeneous group of genera. Some of the Old World members, like *Pseudagrion* and *Archibasis*, contain generalized and easily recognizable forms, whereas others are more highly specialized, viz. *Amphicnemis*, *Nesobasis*, *Papagrion*, *Pericnemis*, *Teinobasis*, and some annectant genera with fewer species. Regarding the last group, it may be remembered that I once redescribed and illustrated some species of *Amphicnemis* and *Teinobasis* occurring in the Philippine Islands. These had been characterized already by Brauer (1868: 541—546), de Selys (1877: 114), and subsequently also by Needham & Gyger (1939). On two occasions (Lieftinck, 1953: 250 and 1957: 161—170), I pointed out that the lower (inner) branches of the upper pair of appendages had been mistaken by all authors for the inferiors, possibly because the latter are sometimes longer and stronger than the upper (main) branches of the superiors, occasionally abutting tightly on the major part of the inferior pair as well, even in the remarkable zygopteron *Pericnemis stictica* Selys. In that species the slender lower branch of the superiors is almost as strongly developed as the pincer-like upper portion. In all known genera of the *Teinobasis* alliance, the superior appendages are deeply divided and consist of two well-developed branches. From dissections and pictures of these sclerites drawn in caudal view, it became quite clear that these processes are parts of a single appendage whose branches are firmly and immovably connected basally, forming together the true superior appendage. Consequently, the interpretation and terminology of the male genital organs as given by Needham & Gyger (1939), are incorrect.

A further complication sometimes averting immediate recognition of the various components of the terminalia, is caused by the existence of a median sclerite emerging from beneath the overhanging ridge of the posterior border of the 10th tergite. This accessory sclerite is usually placed in a vertical plane so as to protect the aperture and the more weakly sclerotised membrane of the body wall. In the course of years, numerous drawings of that structure were published showing it in caudal (see e.g. Lieftinck, 1962, and the author's papers (1932—1949), cited above. It is here termed "Breech-Block"; and though showing great diversity in size and shape among species, its form seems to be quite stable specifically. Its function

is unknown, but in view of the complex form of the female pronotal lobes and mesostigmal laminae, its flexibility is supposed to play an important role in the pre-copulatory process.

Teinobasis aluensis Campion (figs. 24—26)

Teinobasis aluensis Campion, 1924: 614, fig. 2 (♂ app.), ♂ Alu I. (Shortland Is. group). — Kimmins, 1934: 107 (type fixed, ♀ topotype, not descr.). — Lieftinck, 1949: 343 (note on type).

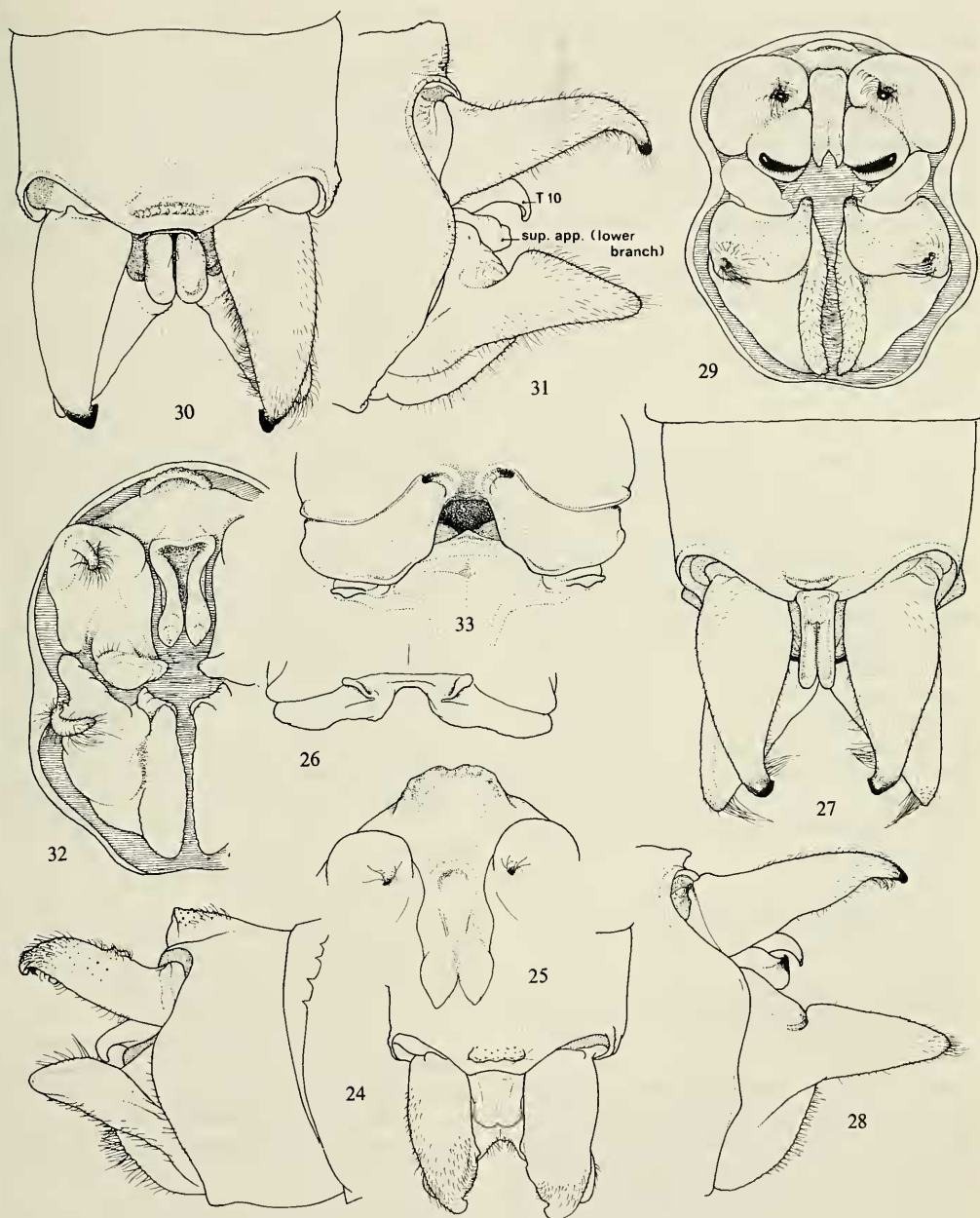
Teinobasis emarginata Lieftinck, 1949: 344—345, fig. 6 (♀ proth.), ♀ juv., Shortland Is. **Syn. nov.**

Papagrion gurneyi Lieftinck, 1949: 341—343, fig. 5 (♂ app.). — ♂ Bougainville I. **Syn. nov.**

Material re-examined. — Solomon Is.: 1 ♂ (adult), Alu, Solomon Is., C. M. Woodford 87—3, with D. E. Kimmins's confirmative type label, holotype *T. aluensis* Campion (BM); 1 ♀ (juvenile), topotypical, det. D. E. Kimmins (BM). 1 ♀ (juvenile), Shortland Is., Hisiai River, 22.x.1936, R. A. Lever, holotype *T. emarginata* Lieftinck (ML). — 1 ♂ (adult), Bougainville I., 6.viii—16.xi.1944, A. B. Gurney, holotype *Papagrion gurneyi*, Lieftinck (USNM).

To the original description a few more details can be supplemented.

Male (adult, holotype Alu I.). — Labrum broadly bordered with yellow-ochre roundabout its obscured centre. Face and frons entirely blue inclusive of the impressed area of the frons. Antennae pale (incomplete). Prothorax short, not modified. Synthorax with complete bronze-black middorsal band occupying the inner halves of the mesepisterna, beyond which the light non-metallic ground is discoloured and obscured; the dorsum gradually acquires a lighter tint beyond the humeral suture, but the somewhat obscured bluish mesepimera are entirely without the distinct wedge-shaped bronze mark(s) seen in *simulans* and *imitans*; sides otherwise blue fading to yellowish underneath. Legs short, resembling *Papagrion* in form; femoral bristles relatively strong, numbering 3, 4, —, respectively (posterior legs missing), slightly shorter than the interspaces; tarsal claws lacking a subapical inferior tooth. Wings much as described for *gurneyi* (loc.cit., 1949) and the other close allies; M₃ and Rs closely approximated at origin, M₃ weakly curved, arising very slightly before, Rs at the subnodus, both veins remaining separated thereafter. Ab entering the posterior margin well beyond Ac; medio-anal link entire; three postquadrangular antenodal cells. All wings with 15 Px of first series. Pterostigma as in *simulans*.



Figs. 24—33. *Teinobasis* — 24, *T. aluensis* Campion, male anal appendages, left lateral and dorsal view (type of *T. gurneyi*); 25, Idem, caudal view; 26, *T. aluensis* Campion, hind margin of prothorax of female (type of *T. emarginata*); 27, *T. simulans* spec. nov., male anal appendages, dorsal view (New Georgia); 28, Idem, left lateral view; 29, Idem, caudal view; 30, *T. imitans* spec. nov., male anal appendages, dorsal view (Guadalcanal I.); 31, Idem, left lateral view; 32, Idem, caudal view; 33, *T. imitans* spec. nov., prothorax of female, dorsal view (Guadalcanal I.).

Abdominal tergite 10 in caudal view shaped much as shown for the type of *gurneyi* (fig. 25) and *imitans* spec. nov. (fig. 32), the vertical surface of the raised upper part of the body-wall slightly convex, black in colour, but its mid-apical process bright yellow (deep black in *simulans*), at first directed obliquely caudad, then strongly hooked, recurved, with bilobed apex.

Anal appendages equal in length to segment 10; colour yellow; superior pair relatively short and broad in dorsal view, slightly but distinctly S-shaped in side view, as shown for *gurneyi* (fig. 24).

Measurements: abdomen + appendages 48 mm, hind wing 31.5 mm.

Female (juvenile, "red" colour phase, Alu I.). — This (undescribed) teneral specimen was examined by me at the British Museum (Natural History) after publication of *T. emarginata*, with which it agrees in most respects, especially in the venation. Prothorax similar to *emarginata*, except that the deeply divided lamellae of the posterior lobe are somewhat more drawn out at the inner edges, so as to resemble the adult female of *imitans* (fig. 33) more closely; in *emarginata* the lobes are more depressed and shrunken owing to the teneral condition of the sclerite. Metallic green marks covering the thoracic dorsum in the form of ill-defined bands occupying the inner halves of the mesepisternites. Its measurements are: abdomen 41.5 mm, hind wing 30 mm.

Teinobasis simulans spec. nov.

(figs. 27—29)

Material. — Solomon Is.: 1 ♂ (adult), New Georgia I., Bareki River, 30.viii.1965, Roy. Soc. Exped. Brit. Mus. 1966—1. Holotype (BM).

Male (adult). — Labium yellow; basal half of labrum (including the central pit) glossy brownish black, its distal half sharply defined bright ochreous; mandible-bases and genae dark olive, anteclypeus more brownish olive, postclypeus dark brown. Frons with well pronounced, almost rectangular transverse anterior crest, the smooth vertical surface dark olive; upper surface of frons, antennal sockets and all remaining dorsal parts of head dull greenish bronzy black with some traces of brown just in front of the ocelli and along occipital crest; occipital area and rear of the head dirty orangish. Scape and pedicel of antenna yellowish, the latter about

1½ times length of scape, its apex brown; distalia black.

Pronotum dark brown, lower portion of tubercles fading to rusty brown, the latter low and but little convex; sides including those of posterior lobe rusty brown, the lobe short and broad, longest at middle, somewhat upturned, its surface convex anteriorly; posterior border in dorsal view throughout evenly and but slightly convex, the side lobes small, not protuberant and rounded.

Dorsum of synthorax as far down as a little before humeral suture and including ante-alar triangles, black with low but distinct metallic green lustre, a hairline at the humeral suture remaining rusty brown; mesepimeron rusty brown, its lower (anterior) half marked with a wedge-shaped brown spot pointing upward and ill-limited above, posterior portion yellowish green, as are also the remaining parts of the sides and ventral surface of thorax; mesinfraepisternites rusty brown with a subcircular blackish central dot low down.

Coxae and trochanters of legs light green; legs otherwise pale ochreous; but outer faces of all femora with two brown stripes partly fused together beyond halfway length; extreme bases and carinae of tibiae as well as all bristles, brown. Hind femora with 4—5 strong bristles in outer row, all a little shorter than the interspaces; tarsal claws lacking an inferior subapical tooth, or a rudiment of a tooth only at the fore tarsi.

Wings narrow, venation brown. Ac situated much nearer Ax₂ than Ax₁, its length a little less than half its distance from proximal side of quadrilateral, which is scarcely longer than Ac itself; Ab enters the margin well distal to Ac at a distance of about twice the length of Ac. Arculus at Ax₂ in all wings. Quadrilateral in fore wing with proximal and costal sides of equal length, in hind wing costal side markedly longer than proximal side. Medio-anal link entire; three subquadrangular antenodal cells. M₃ moderately curved at origin, arising slightly before the subnodus (least so in fore wings), Rs at the subnodus, both veins very closely approximated (just not fused together), from their meeting point to almost as far as Px₁, thence gradually diverging. Broken course of M₄ and Cu₂ dissimilar: fractured portion of M beginning beyond halfway its length, that of Cu₂ much before that level, i.e. at level of Px₂—Px₃. Fore wing with 15—16, hind wing with 14—15 Px of first series. Pterostigma of small size, braced, lozenge-

shaped but very oblique, a little longer than high, its proximal side only a trifle more oblique than the distal one; colour cinnamon, darker brown centrally.

Abdomen long and slender, basal and terminal segments moderately expanded. Segment 1 light blue-green, distal one-fourth of tergite with crescent-shaped transverse brown mark and traces of rusty brown in front of the latter; dorsum of 2 metallic green from base to apex, this mark very slightly expanded before the end, the sides blue-green; succeeding segments for the greater part brownish black with slight bronzy reflections, 3—7 each with pair of small, greenish yellow basal spots forming dorso-lateral annules narrowly interrupted from behind in the median line; sides of 8 with a yellowish stripe, broadest at either end bordering lower margin of tergite; 9 with transverse basal stripe of yellow alongside; 10 with similar stripes basally, the sides as well as the apical 1/3 of the upper surface of this tergite likewise brownish yellow. Intersegmental rings of 8—9 and 9—10 pale. Configuration of 10th tergite and anal appendages as shown in figs. 27—29; colour brownish yellow, including the midapical process of tergite 10; lower branch of superior appendages ending in a transverse, smooth, shining black ridge bearing minute erect light hairs; fringes on the inside at tips of superiors and long tufts at apices of inferior appendages, all pale golden yellow.

Measurements: ♂ abdomen + appendages 46.6 mm, hind wing 29.0 mm, pterostigma 0.5 mm.

Female insular topotype, unknown.

***Teinobasis obtusilingua* spec. nov.**
(figs. 37—39)

Material. — Solomon Is.: 2 ♂ (adult, one in fragments), San Cristoval I., Huni River, mouth Camp 4, 14.viii.1965, "in and around small pools in *Casuarina* forest on basic soils". Roy. Soc. Exped. Brit. Mus. 1966-1. The perfect specimen is the holotype (BM), the fragmentary one a paratype (ML).

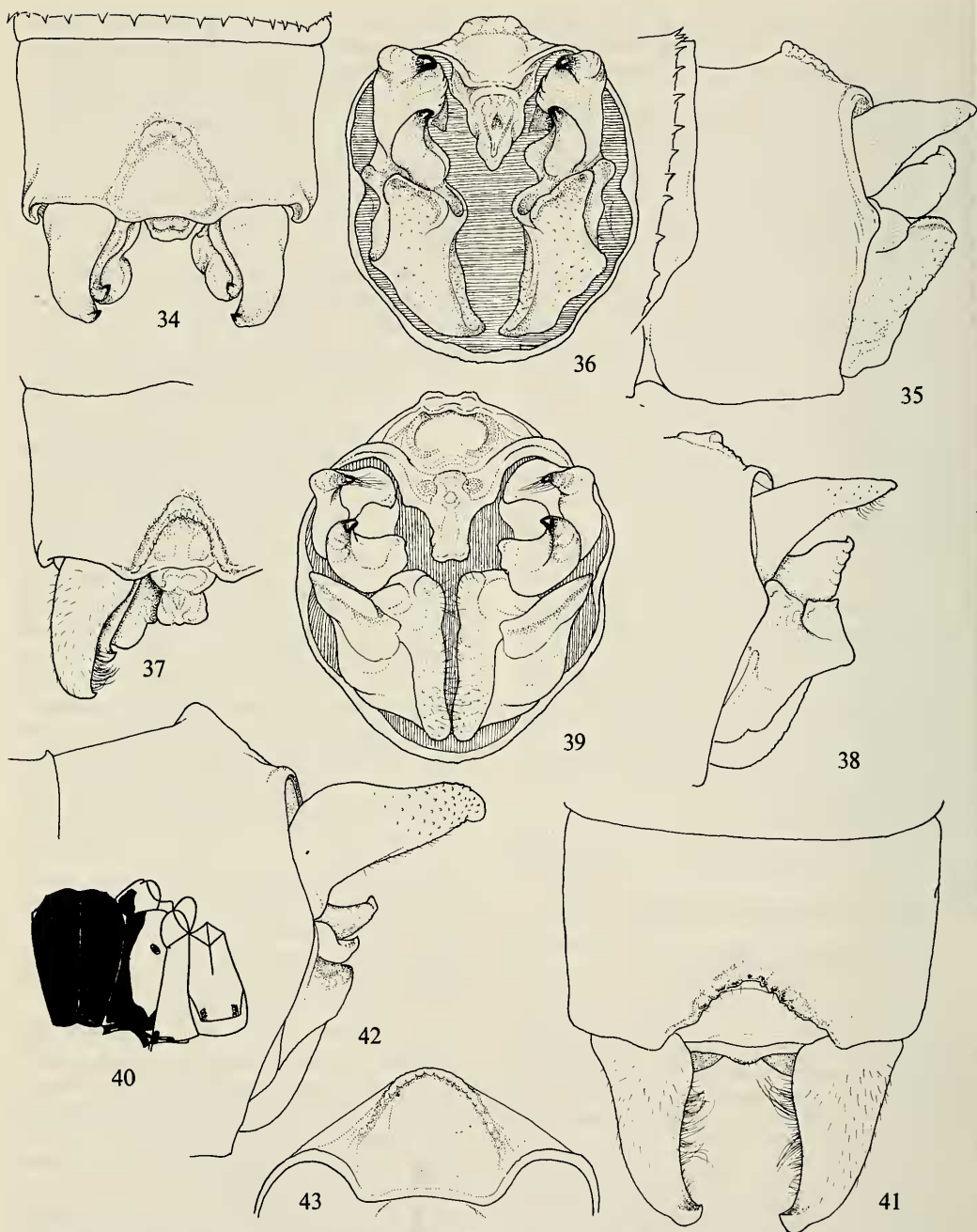
Male (adult, holotype). — Labium yellowish; labrum almost wholly black, only anterior narrowly lined with yellow. Mandible-bases yellowish with a large central spot of brown; genae and anteclypeus dirty brownish, postclypeus glossy brownish black. Frons shaped as described for *chionopleura*, colour deep black with faint bronze reflections, the sulcus between clypeus and frons brown. Head otherwise dull

bronze-black, save for a pair of small, oblique pale streaks, one either side, between base of antenna and lateral ocellus; occipital ridge also somewhat lighter. Rear of head apparently brownish black or black except anteriorly a triangular yellow mark at level of submentum. Antennal scape very short, black, at most one-third as long as pedicel, which is yellowish streaked with brown, flagellars long and slender, black.

Prothorax including posterior lobe, bronze-black, the main portion bearing a broad x-shaped mark occupying the whole dorsum, sides greenish yellow; posterior lobe simple, depressed, much broader than long, surface convex, hind border evenly and broadly rounded, the side-angles narrow, not projecting, rounded. Dorsum of synthorax, as far down as the humeral suture and including ante-alar triangles, black with distinct bronze and coppery reflections; mesepimeron pale rust-coloured, marked with an irregular bronze-black band that covers the lower 2/3 of the area but dorsally narrows abruptly to a stripe extending upward along the impressed part of the first suture, the latter curving round the black dorsal crest so as to almost meet an elongate blackish streak along upper end of second suture; remaining parts of side and ventral surface unicoloured greenish yellow; mesinfraepisternites more rust-coloured, with a large subsquarish patch of bronze-black covering most of that sclerite.

Legs pale ochreous, the coxae mixed with green; outer faces of all femora and the knees narrowly, with complete thick dark brown stripe; four strong dark brown bristles in outer row and five in inner row of hind femora, all shorter than the interspaces. Tibiae and tarsi unmarked; tarsal claws simple, or with the merest trace of an inferior subapical tooth.

Wings narrow, shaped as in *bradleyi*, the apices slightly more pointed. Ac much nearer Ax_2 than Ax_1 , only about one-third as long as its distance from proximal side of quadrilateral, which is nearly twice as long as Ac itself; Ab enters the margin well distal to Ac at a point away from it for about twice the length of Ac. Arculus distinctly distal to Ax_2 in all wings. Quadrilateral longer than in *bradleyi*, its costal side in fore wing longer than proximal side, in hind wing more markedly so. Medio-anal link entire; three postquadrangular antenodal cells. Origin of M_3 and Rs close together, M_3 moderately curved at origin, arising a trifle before subnodus in fore wings, at the latter in hinder pair;



Figs. 34—43. *Teinobasis*. — 34, *T. bradleyi* Kimmins, male anal appendages, dorsal view (Bougainville I.); 35, Idem, left lateral view; 36, Idem, caudal view; 37, *T. obtusilingua* spec. nov., male anal appendages, dorsal view (San Cristoval I.); 38, Idem, left lateral view; 39, Idem, caudal view; 40, *T. bradleyi* Kimmins, thorax; 41, *T. chionopleura* spec. nov., anal appendages, dorsal view (holotype male, Sandfly I.); 42, Idem, left lateral view; 43, Idem, caudal view.

Rs arises a little beyond the subnodus, while both veins gradually diverge immediately after their meeting point (in right hind wing they are fused together for a short distance!). Broken course of M_4 and Cu_2 as described for *bradleyi*. Fore wing with 13—14, hind wing with 12 Px of first series. Pterostigma of small size, long and narrow, braced, much smaller than underlying cell and almost twice as long as high, sides oblique but proximal side distinctly more oblique than distal side; colour deep black.

Abdomen long and slender, shaped much as in *bradleyi*; tergite 1 yellow-green with a trapezoidal bronze-black marking occupying most of the dorsum and broadest posteriorly; 2 with the dorsum bronze-black from base to apex, this mark a little constricted at extreme base and hardly expanded subapically, the sides possibly greenish in life; succeeding segments for the greater part bronze-black, 3—6 or 3—7 each with narrow yellowish basal annules which successively become more broadly interrupted and placed more laterad posteriorly; 8—10 apparently unmarked, but intersegmental rings of terminal segments yellowish.

Configuration of 10th tergite and anal appendages as in figs. 37—39; colour black, except the dorso-apical ridge, the thickened posterior border of last tergite, and most of the inferior pair of appendages, which are light brown; subapical hair-fringe springing from inner faces of superior appendages, also pale.

Measurements: ♂ (holotype) 37.0 mm, hind wing 21.8 mm, pterostigma 0.5 mm.

Female unknown.

***Teinobasis chionopleura* spec. nov.**
(figs. 41—43)

Material. — Solomon Is.: 1 ♂ (adult, holotype), Florida Is., Ngela group, Sandfly Island, Takavali, 22.xii.1965, "common in forest", R. Slooff (ML); 1 ♂ (adult, discoloured), Florida Is., Small Ngela I., Dende, 18.ix.1960, C. W. O'Brien (ex BISH, ML); 1 ♂ (adult, head and part of abdomen missing), Florida Is., Big Florida I., 28.xi.1944, H. E. Milliron (BISH).

Male (adult, Sandfly I.). — Whole labium, including submentum and all parts in front of the foramen, light chrome as are also the genae as far back as the base of squamae, only the mandibles tipped with black. Labrum, clypeus and a transverse band in front of frons connecting the eyes, which reaches up as far as the antennal bases and including the antennal sockets, all

unicoloured orange-chrome. Frontal ridge weakly developed, obtuse-angulate, surface of frons uneven but lacking transverse wrinkles. All the rest of head behind the frontal ridge, entirely dull greenish black to black without any light markings, the rear also wholly black but postoccipital lobes with a pair of bluish pruinulent patches. Scape and pedicel of antenna of the usual shape, short and subequal in length, both obscured but apex of scape yellow-ringed.

Pro- and synthorax entirely metallic bronzy black, all sclerites (except upper portions of meso- and metepimera) thickly overlaid with palest blue pruinescence, leaving only traces of the orangish ground colour at dorsal ends of humeral and first lateral sutures, and posterior edge of metepimeron.

Coxae, trochanters and extreme bases of femora, black, these parts pruinulent blue all over; legs otherwise light orange-yellow, the tips of femora narrowly obscured and all bristles black; femoral bristles slightly longer than the interspaces, numbering 2 + 2, 6—7, and 6, on the three pairs of legs; tibial bristles 5, followed by a row of 6—7 much shorter ones at fore tibiae, 4—5 at mid tibiae, and 5—7 at hinder pair of same; tarsal claws without any indication of a subapical tooth.

Wings hyaline, neuration as for genus, but quadrilaterals rather long; proximal and costal sides subequally long in fore wings, but proximal side only about half as long as costal side in hind wings, the costal and distal sides in the latter being subequal in length. Arculus at Ax_2 ; Ac much nearer Ax_2 than Ax_1 ; Ab entering the wing margin a little less than $1\frac{1}{2}$ times the length of Ac itself beyond it. Three postquadrangular antenodal cells; M_3 arises well before, Rs at the subnodus, base of M_3 normally curved and both veins well separated immediately after their meeting point. M_4 and Cu_2 of normal great length, marginal convexities at end of veins hardly indicated. Fore wing with 16, hinder pair with 15 Px of first series. Pterostigma distinctly oblique, lozenge-shaped but parallel-sided, $1\frac{1}{4}$ times longer than high; colour deep black finely bordered with yellow. Only a single row of 4—5 cells between C and R_1 posterior to pterostigma.

Abdomen long and slender, from end of segment 6 to base of 10 slightly expanded, the latter parallel-side. Ground colour yellowish, but all tergites with predominantly light brown markings, this colour gradually deepening to dark brown and bronze-black toward end of abdo-

men, 8—10 (except laterally) mostly black. Tergite 1 with diffuse brown dorsal mark broadening toward apex forming an ill-defined dark terminal ring, the sides bright greenish yellow; a complete dark mark also on dorsum of 2, deepest in colour and broadest on basal half but leaving tiny yellow streaks on either side at base, the sides also greenish yellow; dorso-lateral bands on 3—7 suddenly abbreviated in front, so as to save a pair of small yellow spots at the bases of each, the latter being largest on 5—7 and coalescent with distinct citron-yellow lines bordering ventral margin of tergites; 2—6 moreover with fine deep black intersegmental annules restricted to the dorsum, those of 8—10 bright yellow; sides, distal one-third of tergite 10 as well as the vertical mid-caudal process of the latter, ochreous.

Anal appendages (inclusive of the 10th apical plate) ochreous, lower branches of superior appendages and the incurved apices of main branch, black-tipped; inner faces of superiors clothed densely with softish pale pubescence.

Measurements: abdomen + appendages 43 mm; hind wing 27.3 mm.

Male (adult, Small Nggela I.). — This paratype is the 2nd complete ♂ whose characters correspond almost exactly with those of the type, except that there are minute traces only of pruinescence, the thoracic sclerites being wholly deep black with low bronze reflections, save the posterior edges of metepimeron and the poststernal surface, which are light ochreous. The legs also are coloured as in the type, only the tarsi being obscured.

Size slightly larger: abdomen + appendages 46.0 mm, hind wing 28.4 mm.

Male (adult, incomplete, Big Florida I.). — Quite similar to the last-mentioned male. However, there is an interesting point of difference in its wing venation: the nervure Ac is placed further distad in both hind wings, i.e. at a level only little away from Ax₂ causing the veins Ac and Ab to meet the posterior border of the wing at one point, which is unusual for *Teinobasis*. In all specimens the medio-anal link is entire.

Female unknown.

This new species is distinctly more slenderly built and has a somewhat larger head, than the members of the *T. aluensis* group, though all are of about the same large size. Further peculiari-

ties are found in the structure of the terminal genital organs by which *chionopleura* differs from its congeners in the Solomons. In caudal view, the raised vertical portion of the 10th tergite (fig. 43), does not seem to bear a prolonged median process but is reduced to a short transverse plate hardly visible in dorsal aspect. The black-tipped upcurved and pointed lower branches of the superior appendages are placed inward to a pair of shorter, blunt and pale-coloured, upper branches of the inferior appendages, both of these being well visible in side view (fig. 42), but hidden from view when looked at from above (fig. 41).

Teinobasis imitans spec. nov.
(figs. 30—33)

Material. — Solomon Is.: 1 ♂ (adult holotype), Guadalcanal I., Honiara, 150 m, 2.v.1964, J. Sedlacek (ex BISH, ML). 1 ♀ (adult), Guadalcanal I., Honiara, 17.ix.1965, "at house lights", Roy. Soc. Exped. Brit. Mus. 1966 (BM).

Closely allied to both *T. aluensis* and *simulans* spec. nov.

Male (holotype, adult, abdominal segments 4—7 missing). — Labium, mandible-bases, and genae as far up along orbital lines as base of antennae, obscurely greenish yellow (possibly green or blue in life), mandibles tipped with deep black; labrum bright chrome gradually changing into brown at extreme base, the boundary almost straight but ill-limited. Antennae and postclypeus black with bronze lustre, surface of anteclypeus uneven, of postclypeus finely transversely striated. All the rest of head, inclusive of postocular lobes and occipital ridge, almost lustreless dark bronzy black; transverse frontal crest distinct, subacute; rear of the head, except some diffuse obscuration on inner surface, bright greenish yellow. Antennal sockets somewhat swollen, scape short and thick, pedicel much slenderer, about 1½ times length of scape, both obscurely yellow.

Prothorax dirty ochreous mottled with dark brown on pronotum and centre of pleurae, the anterior lobe suberect, strongly black-rimmed in front; posterior lobe broad, collar shaped, depressed, its hind margin somewhat undulated, the side-edges rounded, whole surface dark metallic green. Synthorax robust, shaped as in *aluensis* and *simulans* spec. nov.; centre of mesostigma lamina and whole mesonotum with the ante-alar triangles, dark metallic green to as

far as the humeral suture, which is indicated by a yellow hair-line; mesepimeron and mesinfraepisternum beyond that level, mainly light blue, the former bearing two distinct patches of dark metallic green of unequal size, separated from each other by the pale ground colour: a diffuse, oblique zone of a more ferruginous tint. Metapleurae similarly coloured but changing to (or mixed with) clear blue upon middle of metepisternum and to yellow further down, the whole ventral surface of thorax also unmarked.

Legs almost entirely yellow, only outer faces of coxae light blue and those of femora slightly more orangish with the knees a shade darker, the yellow at the tibiae conspicuous; femoral bristles robust, brown, 2—4—5, respectively, little shorter than the interspaces; tibial bristles shorter than interspaces, fore tibiae with four longer bristles followed by a row of ca. 10 thinner ones (setae) in outer row, 4—5 strong ones on mid and hind tibiae. Tarsal claws indistinctly toothed: rudimentary or obsolete on all legs.

Wings long, distinctly petiolated as far as *Ac*, much as in *aluensis*, i.e. more markedly broadened than in the smaller-sized regional *Teinobasis*, but again broader than in the close ally *simulans*; venation brown. Arculus at Ax_2 in all wings; position of *Ac* and *Ab* as in the other species: *Ab* entering margin at a point in line with proximal side of quadrilateral, the latter in fore wing only little longer than, in hind wing almost twice as long as, costal side. Medio-anal link entire; three postquadrangular antenodal cells. M_3 arises well before, Rs at the subnodus, the former moderately curved, both veins well separated after their subnodal meeting point. M_4 and Cu_2 of great length, the broken course of M_2 beginning at Px_{6-7} in fore wings, at Px_{8-9} in hinder pair, and of Cu_2 at Px_{2-3} . Fore wing with 16, hind wing with 15 Px of first series. Pterostigma small, oblique, much longer than high, lozenge-shaped but subparallel-sided, braced and much smaller than underlying cell; colour brown narrowly lined with yellow along proximal and costal sides. Between *C* and R_1 posterior to pterostigma 1—2 divided cells about halfway length of space (undivided in right hind wing only).

Abdomen (incomplete), ground colour of tergites 1—2 blue, on succeeding segments dirty ochreous; 1 with complete subtriangular dorsal mark of metallic green pointing basad, sides broadly blue; dorsum of 2 metallic green from base to apex, leaving only a pair of narrow sub-interrupted blue annules at extreme base, the

lower half of sides yellow; dorsum of 3—7 apparently similarly banded, but losing gradually their metallic gloss and becoming broader and darker toward end of abdomen, only at base of 3 a pair of semicircular yellow spots confluent with the pale ground colour at the sides; 8—10 almost wholly black, but intersegmental membranes of 8—9, 9—10 and 10—sup.app., standing out clearly as bright ochreous dorsal annules, the swollen dorsolateral ridge at apex of tergite 10 also yellow.

Anal appendages (figs. 30—32) subequal in length to segment 10, shaped very similar in principle to those of *aluensis*, its synonym *gurneyi*, and *simulans*. Dorsal (main) branch of superior appendages black above and black-tipped, yellow and rather hollowed out within, each provided with tuft of long pale golden hairs (resembling *simulans*); inferior appendages also yellow above and densely light-haired, obscured ventrally.

Female (adult, topotype). — Resembles the male very closely in most respects, differing only in colour design of body and legs, as follows.

Labium, upper mouth-parts, face and frons as well as first two antennal segments, all light ochreous, but at mandibles and genae slightly mixed with olive, the labrum being more brightly orange. Rest of head above dull bronze-black, sharply contrasting with the greenish yellow rear. Antennal pedicel dark-ringed apically, the distalia black.

Prothorax (fig. 33), reddish ochreous, margins of posterior lobe obscured, the latter hardly raised; laminae mesostiginales transverse, carrying light brown, erect, ear-like lobes. Synthorax much as in male, bronze-green dorsally to just before humeral suture, the suture itself pale, the bronzy tint including ante-alar triangles, mid-ventral and axillary sclerites; colour at sides and underneath, all dirty ochreous. Brownish patch upon shoulder area (mesepimeron) very diffuse, with slight metallic green gloss.

Legs totally yellow save outer faces of coxae blue and those of femora orangish, armature as in male. Claws with rudiment only of an inner subapical tooth. Wings well petiolated, with brown neurulation; medio-anal link entire though slightly fractured in left hind wing. Wing tips relatively obtuse; all wings with 15 Px of first series. Pterostigma as in male, light brown surrounded by yellow; area between *C* and R_1 distal to pterostigma exactly as in male.

Abdomen yellow-brown gradually darkening

toward end; tergites 2—7 indistinctly obscured apically, 3—8 moreover with very narrow ill-defined yellowish basal rings interrupted by the yellow-brown dorsal colouring; intersegmental membranes dark, except those between 7—8 and 8—9, yellow; tergites 8—10 metallic greenish black, the lower half of sides pale. Genital valves not surpassing apex of segment 10, carrying a row of minute, blunt marginal serrations; cerci obscured, shorter than segment 10, divergent, pyramidal, tips acute.

Measurements: ♂ abdomen + appendages 47 mm (approx.), hind wing 31.5 mm; ♀ abd. 46.0 mm, hind wing 32.6 mm, pterostigma 0.6 mm.

This is probably the closest relative of *aluensis*. Apart from minor colour features of less importance, male *imitans* differs from *aluensis* in the following points: (1), the whole posterior surface of the vertical process (or "brechblock"), at the apex of the 10th tergite, is deep black (bright yellow in *aluensis*); (2), the outer faces of the main (upper) branch of the sup. app. and their lower branches as well, are also black, the latter being very shiny; (3), the appendages are longer and more slender, less hollowed out within, than in *aluensis*; (4) the inf. apps. of *imitans* are obscured ventrally but yellow on the inside and clothed densely with pale pubescence, the tip with the long fringe of pale golden hairs directed inward (only partly shown in fig. 31). In both species the median process of the 10th tergite is broad and somewhat flattened when viewed from above, but strongly hooked and downcurved in profile view (cf. figs. 30 and 31).

***Teinobasis bradleyi* Kimmins**
(figs. 34—36, 40)

Teinobasis bradleyi Kimmins, 1957: 315—316, tfigs. 2 A—C (♂ thorax & anal apps.). — ♂ Guadalcanal I.; Kimmins, 1970: 183 (♂ lectotype selected).

Material. — Solomon Is.: 2 ♂ (adult, one imperfect), Guadalcanal I., Tapenanje, 10—23.xii.1953, lectotype and paralectotype (BM). — 2 ♂ (adult), Malaita I., Ngwaiu, 1500 ft., 10.x.1967, "in forest", R. Sloof (ML). — 1 ♂ (adult), Santa Ysabel I., Maring dist., Te natahi, 2.vii.1960, C. W. O'Brien (ex BISH, ML). — 1 ♂ (adult), Bougainville I., Buin, 2.i.1970, R. Straatman (ML); 2 ♂, 1 ♀ (adult), Bougainville I., Buin town, 15—16.v.1975, "along small stream", H. R. Wimmer (USNM), and Bougainville I., 16.xi.1944, "ex jungle by stream" (one pair), A. B. Gurney (USNM); 1 ♀ (juvenile, red), Bougainville I., Buin, 4.vi.1956, J. L. Gressitt (BISH).

Male (adult, Tapenanje). — The following colour and structural notes are additional to those given for the lectotype, subsequently selected by Kimmins for one of his specimens from Guadalcanal.

Differs from *T. obtusilingua* spec. nov.: anterior margin of labrum more broadly bordered with chrome. Face and frons in front, bright blue. Thoracic pattern wholly different, as shown by Kimmins (loc. cit., tfig. 2 A) and in our fig. 40. Inner faces of sup. anal app. beset along whole length with long pale hairs (in *obtusilingua* only at apices); appendages very similar in the two, but mid-apical process of tergite 10 broader and tapering to a blunt point, deep black, as shown in fig. 34 (see also Kimmin's tfig. 2 C). From *T. aluensis*, the present species differs in that the vein M_3 arises before, and Rs at the subnodus, but this character may be unstable; *aluensis* is also a somewhat more robustly built and larger species than *bradleyi*, the type of the latter measuring abdomen + appendages 39 mm, hind wing 26 mm. The "slight undulations of the wing apices", mentioned by Kimmins, apply to the prominent posterior border at the end of the main veins, not to the apical undulations, as seen in a number of regional platycnemidids.

Female. — No insular topotypes are available.

Close comparisons made between typical *bradleyi* from Guadalcanal and all specimens collected in the island chain of Malaita, Santa Ysabel, and Bougainville, have led to the conclusion that all these populations belong to a single species which, accordingly, seems to have a much wider distribution than was thought at the outset of this investigation. All agree in their wing venation, the scheme of coloration, and their genital structure, only the body size and details of colour having been noticed. The next descriptions and drawings are based on the best preserved and fully mature specimens from Bougainville, which also include a well-coloured female from that most westerly situated island of the chain.

Male (adult, Bougainville). — Labium palest yellow, labrum glossy black, the anterior border, except laterally, yellow, a vestige of a yellow spot also on either side at extreme base; mandible-bases light blue, the distal one-third brownish black; anteclypeus light blue, postcly-

peus glossy black; entire genal area and antefrons as far as the transverse ridge and insertion point of antennae light blue, this colour extending posteriorly all along orbital margin to beyond base of maxillae; remainder of frons and all the rest of head including the occiput, black. Frons and ocellar area with low bronze reflex, behind which the interocular and occipital region with more distinct dark metallic green lustre. A tiny oblique yellow spot just visible between antenna and lateral ocellus. Occipital lobes slightly pruinose blue, an oval patch of blue pruinoscence placed more rearward also upon centre of occiput. Cervix yellow.

Whole dorsum of prothorax black with slight bronze sheen, the sides light blue; pronotal tubercles low, evenly convex; posterior lobe simple, rather crescent-shaped, surface convex and directed straight back, about twice as long as the side lobes, which are rounded off; whole border evenly rounded, hardly swollen or upturned.

Dorsum and upper part of sides of synthorax, black, as shown in fig. 40, for the rest all vivid light blue, as described for the type by Kimmins (1957, fig. 2 A). All dorsal ridges and humeral suture with the exception of a vestigial spot of blue at either end of the latter (one to the inside, the second at the dorsal ridge of suture), likewise black; inner portions of black mesepisterna with distinct metallic green lustre, the remainder deep black; a sharply contrasting brown hair line laterally, and a pair of posterior dark spots on the poststernum.

Coxae and trochanters of legs blue; femora pale greenish blue with complete, thick, dark brown exterior stripe broadening to an apical ring at the knees; tibiae yellow-brown tipped with ochreous; tarsi bright orange-chrome. All spines and bristles black; femoral bristles as long as the interspaces, 3, 4, 4, respectively; tibial bristles longer, also equalling interspaces, 5, 4, 5, respectively; tarsal claws lacking an inferior tooth, the tips obscured.

Wings narrow, neurulation much as in all other regional congeners; membrane hyaline, veins black. Ac situated much nearer Ax_2 than Ax_1 , only half as long as its distance from the quadrilateral, which is slightly less than twice as long as Ac itself; Ab enters the margin well distal to Ac, for fully twice the length of Ac. Arculus at Ax_2 in fore wings, very little beyond that level in hinder pair. Quadrilateral of fore wing with proximal side little shorter than costal side, in hind wing costal side markedly longer, twice as long as proximal side and subequal to distal

side. Medio-anal link entire; three postquadriangular antenodal cells. M_3 and Rs closely approximated at origin, base of M_3 but little curved, arising slightly before, Rs slightly after the subnodus, both veins well separated distal to their meeting point. Broken course of M_4 and Cu_2 dissimilar: fractured portion of M_4 beginning far distad, i.e. at level of Px_{10} in both pairs of wings, of Cu_2 at level of Px_3 , both portions in the latter subequally long. Fore wing with 13—14, hind wing with 13 Px of first series. Pterostigma small, almost twice as long as high, oblique but almost parallel-sided, surmounting exactly one much larger cell; colour brownish black, costal and anal sides bordered with extremely fine pale hair-line.

Abdomen very thin and slender, basal segments more expanded than terminal ones; sides of tergites 1—2 largely blue, dorsum of both with complete metallic greenish black band broadening markedly toward end though, after a subapical constriction, forming almost complete dark terminal annules, the intersegmental membrane 1—2 blue; dorsum and most of the tergal sides 3—7 occupied by well defined bronze-black marks from base to apex, leaving only vestigial paired yellowish spots at extreme base, the dark bands broadening somewhat posteriorly, the rest of the tergites bright ochreous in colour. Tergite 8 with the dorso-lateral mark hardly broadening posteriorly, on 9 almost straight-lined, and the one on 10 leaving only a triangular spot along lower border. All intersegmental membranes dorsally as well as the sternites, bright chrome yellow. Configuration of 10th tergite and anal appendages as in figs. 34—36, colour black or almost so, only inner shelves of main branch of inferior appendages yellowish, the hairs fringing inner faces and apices of upper branch of superior appendages distinctly white.

Female (adult, Bougainville). — This was collected simultaneously with the male and corresponds closely with the latter in stature and venation. Here follows a comparative description.

Labium bright yellow. Labrum black only at middle along base, all the rest of it vivid orange. Anteclypeus obscured, dullish; postclypeus contrastingly deep glossy black, except laterally and on the mandible-bases which are coloured a dirty greenish ochreous, yet acquiring a more vividly green tint on the genal area and forming a broad colour band also on the antefrons as far up as the antennal sockets and frontal ridge;

first antennal segments partly obscured. Whole upper surface of head dark metallic green, much less shiny than the black postclypeus, light marks restricted to a pair of tiny oblique specks placed about midway between lateral ocelli and antennae; a thick transverse bar upon the occipital plate at some distance behind lateral ocelli, also pale. Rear of the head deep black, the pale genal area extending upward along eye-border as far as base of labial hinge, the black area thinly pruinose.

Prothorax ferruginous brown, its sides overlaid with bluish pruinoscence; posterior lobe larger and more raised than in male, median portion dome-shaped in caudal view, its border broadened a little on either side of middle to form slightly forwardly curved, rounded lobes, which are convex anteriorly, hollowed out posteriorly. Synthorax marked exactly as in male, except that the dorsolateral parts are ferruginous instead of black, only the middorsal carina and a complete parallel-sided band attached to it on either side, metallic green, this median band almost equal in width to each of the mesepisternal (antehumeral) halves; remainder of thoracic sides as well as the ventral surface throughout pale blue, slightly pruinose lower down. Legs coloured as in male, i.e. vivid light chrome, the bases of all coxae blue, a complete though narrow black stripe at outer faces of all femora, these stripes broadening at end to form distinct apical annules; bristles black. Shape of wings and venation as in male, the relatively long pterostigma light brown finely surrounded with yellow. Px of first series 15 in fore wings, 13 in hind pair.

Abdomen comparatively slender, the terminal segments but little expanded. Ground colour greenish yellow, all segments marked with bronze-green dorsal bands, complete on tergites 1—2, both broadening toward end, those on 3—7 more abruptly narrowed basally and expanded apically, the small yellow basal annules finely interrupted in the median line; colour of apical tergites obscured, broadly yellow at sides. Genital valves darkened, surpassing tuberculum anale and cerci for about half length of segment 10, yellow-tipped; cerci pricker-shaped, yellow.

Measurements: abdomen (incl. valves) 35.5, hind wing 25.0, pterostigma 1.0 mm.

Female (juvenile, red colour phase). — Ground colour of whole body bright orange-pink; dark markings much as in male, differing as follows. Labrum wholly pale save for a deep

black midbasal spot; front of face likewise, except postclypeus deep black. Dorsum of prothorax with a fine X-shaped black mark and a median spot at extreme base of its posterior lobe, the latter shaped much as in the adult, but side-lobes more rounded. Synthorax with the metallic green dorsal band a little narrower, standing out clearly on either side of the median carina, which remains orange, as also the antealar triangles. Abdomen as in the adult female, but end segments 9—10 for the greater part orange.

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